6-1-1960

# The impact of the federal soil bank program on the economy of Coos County New Hampshire 1956-1959, Station Bulletin, no.468

Andrews, Richard A.

Frick, George E.

New Hampshire Agricultural Experiment Station

# THE SOIL BANK PROGRAM IN COOS COUNTY, N. H.

Station Bulletin 468 June 1960

Agricultural Experiment Station
University of New Hampshire
Durham, New Hampshire

This Bulletin cover is a map of

# COOS COUNTY
# NEW HAMPSHIRE

taken from a State map

PREPARED BY THE

New Hampshire Department of Public Works and Highways
Planning and Economics Division

IN COOPERATION WITH THE

Department of Commerce
Bureau of Public Roads

1958

LEGEND

- State Line
- County Line
- Town Line
- State Capitol
- Population over 10,000
- Population over 1,000
- Population under 1,000
- United States Numbered Highway (3)
- State Highway Numbered System (16)
- Railroad
- Divided Highways
- Portland Cement
- Bituminous Concrete
- Bituminous Macadam
- Surface Treated Gravel
- Gravel
- Less than Gravel
- Town Roads Class V
- Town Roads Class VI
- Forest Highways

Compact Area

Interchange

# The Impact of the Federal Soil Bank Program on the Economy of Coos County New Hampshire 1956 - 1959

By

**Richard A. Andrews and George E. Frick**

Department of Agricultural Economics
Agricultural Experiment Station
University of New Hampshire
Durham, New Hampshire

and

Farm Economics Research Division
Agricultural Research Service
United States Department of Agriculture

with cooperation of

New Hampshire and Coos County
Agricultural Stabilization and
Conservation Committee
United States Department of Agriculture

## PREFACE AND ACKNOWLEDGEMENTS

The appraisal of the Soil Bank made in this study covers the impact of the Conservation Reserve Program during its first four years of operation in Coos County, New Hampshire. The Program for 1960 had not been released by the United States Department of Agriculture at the time data were gathered for this study. At time of publication, however, the enrollment in the 1960 Program was about 1,000 acres of cropland in Coos County. A preliminary appraisal of the agricultural units enrolled in the 1960 Program indicates little need for change in the final conclusions concerning the impact of the Program on the economy of Coos County, although it did raise the proportion of the county cropland enrolled from 17 to 20 percent. Thus, the factual data as well as the conclusions of the study generally apply to five years of operation of the Soil Bank Program in Coos County.

The New Hampshire State Agricultural Stabilization and Conservation Committee in recognizing the need for an economic study of the Soil Bank Program made it possible for the Coos County Agricultural Stabilization concerning the impact of the Program on the economy of Coos County, Committee provided office records of participators in the Soil Bank and carried out the enumeration of a field survey under the direction of Mr. Norman Craggy. The analysis and interpretation of data are, however, the responsibility of the authors.

The authors wish to thank W. F. Henry, Department of Agricultural Economics, University of New Hampshire, and C. W. Crickman, Farm Economics Research Division, Agricultural Research Service, for their critical appraisal of the manuscript. The authors also wish to thank H. L. Scheibel, Mrs. R. M. Batchelder, and Mrs. R. C. Slanetz for their handling of graphics, typing, and data. Errors in fact or judgment are of course the responsibility of the authors.

## CONTENTS

## SUMMARY

### The Soil Bank

The Conservation Reserve Program under the Soil Bank Act is designed to help adjust farm production to market demands and to promote conservation of soil, water, forest, and wildlife resources.

Participants in the Program agree to keep a specified acreage of land out of production of farm crops for 3 to 10 years. They also agree to protect the soil with vegetative cover, which includes trees.

### Agriculture in Coos County

The number of farms has decreased by half in the last 30 years. Acres of cropland and numbers of cows have also dropped. Milk production — the main farm product — however, has stayed about the same. Larger farms with better cows and land make up present-day agriculture.

### Resources Enrolled in the Soil Bank

Many part-time farmers and owners of unorganized units found the Conservation Reserve Program more profitable than selling standing hay. Some dairy and other types of farms are enrolled also. For the first 4 years of the Program — through 1959 — a total of 129 landowners signed up 5,204 acres. Allowing for historical downward trends and resource quality, the estimated net effect of the Program is a reduction of 4,350 acres of cropland and the equivalent of 195 cows.

One hundred and twenty whole farm units were enrolled in the Program. Twenty-six were classified as commercial farms, and this included 4 poultry farms that continued operations. The rest of the units were part-time or completely unorganized farm units that sold only hay. Forty-eight of the whole units were selling only hay as far back as 1940. There were no farm buildings on 53 and no dwellings on 37 whole units.

### Impact of Soil Bank on Agriculture

The Conservation Reserve Program reduced cropland by 17 percent and milk production by about 3 percent.

Gross income to participants has changed very little because of the Program. Income in the form of Conservation Reserve payments compensates for the loss of earnings from crop production. But the expenditure pattern of participants has changed. Expenditures for farm operating goods and services have decreased. Thus the purchase of more consumer goods is anticipated.

Historical trends were hastened because of the large number of small or uneconomic holdings that were enrolled, which speeded up the trends in land abandonment. But the costs of nonparticipating farmers and potential farmers have increased because putting land in the Soil Bank has decreased local hay supplies and the number of acres or farms available for renting or buying for enlargement of many farms too small for efficient operation.

Changing land use has also been facilitated. More than half the enrolled acreage of cropland was converted to forest land without the long period of unproductiveness associated with natural forest reproduction.

## Other Impacts of the Program

In several towns, the tax base will be reduced by enrollment in the Conservation Reserve. However, only 4 towns in the county have more than 15 percent of their valuation represented by agricultural properties.

The cost of local governments may be reduced as many enrolled farms are at ends of roads and on the poorer roads. Snow plowing and school transportation are the main cost-reduction possibilities.

## Conclusions

The Conservation Reserve Program has not changed total agricultural production in the county significantly. Only a few commercial farms are enrolled in the Program. Most of the acreage came from uneconomic units.

Total income to the county remains about the same. The expenditure of the income will change, with more spent on consumer goods and less on farm supplies and services.

Nonparticipating farmers face increased costs through a reduction in sources of supplemental hay for feed and of land for expanding farm size. Costs of marketing and other services will not be affected.

The Program has eased the transition of some people and many acres of land out of agriculture. Desirable forest stands were established and conservation of resources is enhanced.

# The Impact of the Federal Soil Bank Program on the Economy of Coos County, New Hampshire, 1956-59

By Richard A. Andrews and George E. Frick[1]

## PROBLEM

The placement of 17 percent of Coos County cropland in the 1956-59 Soil Bank Programs by 129 landowners has created interest and concern about the impact of the programs on other farmers in the county and on the local economy. Dealers handling farm equipment and supplies are concerned as to how their volumes of business will be affected with the fewer farmers to serve. Other merchants, business people, and service workers are concerned about the demand for their goods and services. Nonparticipating farmers face a possible loss of source of local feed supplies and a loss of market facilities or higher marketing costs due to a reduced volume.

## SCOPE AND OBJECTIVES

The purpose of this report is to appraise the impact of participation in the Soil Bank Program in 1956-59 upon the economy of Coos County. It recognizes that the Soil Bank Program is only one of many forces at work causing changes in the local economy. Specific attention was given to the agricultural portion of the economy. However, other segments of the economy were analyzed to establish a basis for interpreting the impact of the Soil Bank Program on the changing economy.

Where several major forces, either singularly or jointly, were influencing the activity level of the farm economy, the boundaries of the study were broadened to include them in the analysis. Three major objectives formed the basis of the study:

First was the end or goal of the Soil Bank Program to reduce agricultural production and promote conservation of the Nation's land resources. Since 1920, the number of farms, the number of livestock, and the acreage of cropland have declined. A continuation of these trends would have been expected during the 1956-59 period. Therefore, the objective was to determine the net effect of the Program on agricultural production and land conservation considering the changing agricultural economy.

Second is the impact of the Soil Bank Program on the economy of the county. The objectives here were to appraise the changes in land use and income flows associated with the Program with respect to the income position of nonparticipating farmers as well as members of the nonfarm economy.

---

[1] Assistant Agricultural Economist, New Hampshire Agricultural Experiment Station, and Agricultural Economist, Farm Economics Research Division, Agricultural Research Service, USDA, respectively.

Third is the very general question of the optimum use of productive resources. This objective was to determine whether the Soil Bank Program has encouraged a more efficient use of farm resources. That is, whether agricultural production has moved to the "best" land closest to assembly points, keeping the "best" buildings and the "best" machinery and cows. Improved resource efficiency is important, it is only with this optimum pattern that desired production can be obtained with the least human effort.

## SOURCE AND NATURE OF DATA AND METHOD OF ANALYSIS

A complete enumeration of Coos County farms done in 1940 provided the benchmark for this study.[2] This enumeration identified each farmer in the County, location of operation and size of unit in terms of cow numbers, poultry numbers or acres of potatoes, other crops or enterprises. Using the 1940 study as a base comparison, local Community Committeemen of the Agricultural Stabilization and Conservation Service were asked to identify the agricultural units as shown in 1940 and to determine whether the unit in 1959 was still operated as an independent unit. If the unit was still operating independently in 1959, the owner, size of operation in terms of livestock, and acres of cropland were reported. However, if the unit was not operated as an independent unit in 1959, the Community Committeemen identified the last farm operator, the year in which operation ceased, the present cropland use, and the ownership arrangement.

Data on Soil Bank Cooperators were obtained from the Coos County Agricultural Stabilization and Conservation Office, and the local Community Committeemen. These data indicated the extent of cooperation and described the farm in terms of land productivity, planned land use, historical land use, the quality and quantity of nonland resources, and planned employment of these resources.

Resources, as well as number of productive units of livestock or crops on participating and nonenrolled units, are added. From the summation, the amount of resources enrolled and the effects of the disposal of the nonland resources released on the local farm economy is appraised by the type of resource. Trend and budget analysis is employed to approximate the changes resulting from participation in the Soil Bank Program.

## THE SOIL BANK PROGRAM

The Soil Bank Program was initiated late in 1956 to reduce production of surplus farm commodities throughout the nation and to promote conservation of the nation's land resources. The Program as established is in two parts: The Acreage Reserve Program and the Conservation Reserve Program.

The Acreage Reserve Program was designed to reduce production of the allotment crops. These crops are wheat, cotton, corn, rice, and most types of tobacco. This part of the Program was not applicable to Coos County.

---

[2] Woodworth. H. C. and Holmes, J. C., unpublished material, Dept. of Agr. Econ., Univ. of New Hampshire, 1941.

The Conservation Reserve Program is a long-term measure designed to help adjust farm production to market demands and to increase the conservation of soil, water, forest, and wildlife resources. This part of the Program is applicable to Coos County. When reference is made in this report to the Soil Bank Program we refer to this part of the Program.

Persons who enroll in the Conservation Reserve Program enter into contracts of 3 to 10 years duration. The enrollee agrees to keep a designated area of cropland out of production for the duration of the contract and to provide for soil protection with permanent vegetative cover. The Federal government assists cooperators by sharing the cost of establishing conservation practices in addition to making annual payments during the period of the contract. The Agricultural Stabilization and Conservation Service (ASC) of the U. S. Department of Agriculture is the agency responsible for the functioning of the Program.

When the Program began in the fall of 1956, annual rental payment rates were $3 per acre for hayland and $10 per acre for land in row crops and grain. Participation in the Program was slight. Major changes in the rental rate and qualifications for participation were incorporated in the 1959 Program. The bulk of the land units enrolled in the Program qualified under the 1959 Program. The rate structure for land as outlined in the 1959 Conservation Reserve Program is as follows:[3]

a. The basic State rate for New Hampshire has been established as $13 per acre.

b. On the basis of land productivity the State ASC committee has established average per-acre rates for the counties as follows:

| | | | |
|---|---|---|---|
| Belknap | $13.00 | Hillsboro | $12.00 |
| Carroll | 11.50 | Merrimack | 12.50 |
| Cheshire | 13.00 | Rockingham | 12.00 |
| Coos | 14.50 | Strafford | 12.00 |
| Grafton | 14.50 | Sullivan | 12.50 |

c. The county ASC committees will establish a maximum annual payment rate per acre for all land offered for the program. These individual farm maximum rates may vary from 50 percent below to 150 percent above the county average, primarily on the basis of relative productivity, rental rates and agricultural land values. Upper limits of no more than 20 percent of the value of the land, and $25 per acre have been established.

(1) The regular maximum payment rate for a farm may be earned by putting into the conservation reserve land which has been growing row crops and small grain.

(2) A lower rate of per-acre payment, 50 percent of the regular maximum rate for the farm, may be earned by putting in land diverted from hay.

(3) Under the incentive plan to get all cropland on individual farms in the program, *farmers who put all their eligible*

[3] "General Provision of the 1959 New Hampshire Conservation Reserve Program and List of Approved Practices", Agricultural Stabilization and Conservation Office, Durham, New Hampshire, August, 1958.

*land in the conservation reserve will earn the full regular rate plus a 10 percent bonus for all their eligible acres.* If the individual farm's regular rate was $14, the 10 percent increase would bring the applicable rate to $15.40 per acre. To earn this rate the contract period must not be less than 5 years.

(4) On farms where only part of the eligible land is put in the reserve, the annual rental rate will be lower if the land designated for the reserve is below the average for the farm in productivity.

The definition of a "Farm" and "Cropland" as outlined in the 1959 Program are as follows:[4]

1. "Farm" means all adjacent or nearby farm or range land under the same ownership which is operated by one person, including also:

   a. Any other adjacent or nearby farm land which the county committee determines is operated by the same person as part of the same unit in producing livestock, or with respect to the rotation of crops and with workstock, machinery, and labor substantially separate from that for any other land.

   b. Any field-rented tract (whether operated by the same or another person) which, together with any other land included in the farm, constitutes a unit with respect to the rotation of crops.

   A farm shall be regarded as located in the county in which the principal dwelling is situated. If there is no dwelling thereon, it shall be regarded as located in the county in which the major portion of the farm is located.

2. "Cropland" means farm land which was tilled or was in regular crop rotation during the year immediately preceding the first year of the contract period, including also land which was established in permanent vegetative cover, (other than trees) since 1953, and which was classified as cropland at the time of seeding.

## THE COOS COUNTY FARM SETTING SINCE 1920

The bulk of the Coos County agricultural plant was inherited from previous generations by the farmers of the 1920's. It was a legacy well suited to early nineteen-hundred conditions for a prosperous agriculture. Many barns, 100 feet long or longer, housed sizable dairy herds and provided storage for abundant hay crops. Horses were the source of farm power. They and their equipment were well adapted to the rolling hills. A moderately stony or small field was not an uneconomic unit for horse-drawn equipment and hand production methods.

---

[4] See Footnote 3, op. cit.

Many subsistence farms were on the scene in 1920 and surplus labor on these farms was an excellent source of manpower for the few 40- and 50-cow farms found in small numbers. The Colebrook area was more fortunate than dairy areas to the south or in the Androscoggin River Valley. Colebrook farms were larger, the fields freer of rocks and the climate and soil better adapted to dairying. Small hill farms were still very common in the Lancaster, Jefferson, Whitefield, and Dalton areas.

The majority of the commercial dairy operations were small according to today's conditions. Many herds contained from 3 to 10 cows. Small volumes coupled with less favorable prices and better off-farm employment opportunities encouraged many rural families to give up farming. Farm numbers, cow numbers and harvested cropland declined in the late 1920's as adjustment to new conditions were made (Table 1).

**Table 1. Number of farms, milk cows and acreage of cropland, Coos County, New Hampshire, 1925-54***

| Item | Census year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1925 | 1930 | 1935 | 1940 | 1945 | 1950 | 1954 |
| Number of farms ..... | 1356 | 1214 | 1289 | 1136 | 1171 | 917 | 670 |
| Number of milk cows ..... | 11224 | 11123 | | 9111 | 8678 | 7575 | 7951 |
| Acres of cropland and cropland pasture ..... | 70814 | 61408 | 55413 | 60900 | 51139 | 46605 | 35204 |

* *Agricultural Census*, Bu. of the Census, U. S. Dept. of Commerce.

The conditions of the 1930's and 1940's interrupted and postponed adjustments in farming. Nonfarm job opportunities vanished during the economic depression of the 1930's. Rural people were held on farms and some urban dwellers moved to subsistence-type farms. Instead of a decline in farm numbers which amounted to about 28 farms per year in the late 1920's, farm numbers increased an average of 15 per year during the early 1930's. The very favorable price conditions that existed during the early 1940's also tended to maintain the number of operating farms.

Production methods and farm equipment changed drastically between the 1920's and the 1940's. Tractor power replaced horse power and rubber tires permitted over-the-road travel for most equipment. The changes in technology enabled the farm family to operate on a much larger scale. As increased supplies of equipment became available at the end of World War II, farmers who were unable to adjust to the "new age" of mechanization gave up farming and relinquished use of their cropland to those who could make or continue the change in mechanization.

Farm numbers dropped sharply from 1945-50. The Korean War momentarily stabilized dairy farm numbers but the pressure of postwar prices caused a further decline in farm numbers and acreage of cropland harvested.

The potato enterprise is the only other enterprise that competes with dairying for use of the cropland in Coos County. Historically, most of the dairy farms had small acreages of potatoes for sale as a cash crop. However, as potato equipment became more specialized and costly, production shifted to larger specialized units. A few large commercial potato

growers still operate in the County, but they use only a small percentage of the available cropland.

The general picture of the County's agriculture has been one of a reduction in use of land resources, in numbers of men employed and in number of cows. Increases in efficiency and the use of such capital items as machinery and fertilizer have compensated for these reductions and production of milk has remained relatively stable.

The retirement of cropland lags the retirement of labor and cows out of this dairy economy. Typically, when a farm ceases operation as an operating unit, the land remains in production and either is rented for a small fee or is merely used by a neighboring farm operator. Hay is harvested until it no longer returns a yield greater than the cost of harvesting. Then most frequently the land is grazed. Natural reproduction of forest trees begins to occur along the wooded edges of the fields. Eventually the fields revert to their natural state of forest cover.

It is within this setting of a declining land use economy, with farm operations based on many acres of cropland operated at low intensity, often by nonowners, that the Soil Bank Program should be appraised.

## CHANGES IN THE EMPLOYMENT OF FARM RESOURCES DUE TO THE SOIL BANK PROGRAM

The impact of the Soil Bank Program on the farm economy can be measured either in terms of farm numbers, resources and products involved, or in terms of farm income and farm expenses. Because both types of measures are meaningful, both are analyzed. As a point of departure, the resources involved in the Program are discussed first. When possible, trends in resource use are analyzed to better define the net effect of the Program.

### Number of Units Enrolled

Participants in the Program in Coos County signed a total of 129 contracts. Of these, 120 were for the complete rural unit while 9 were for some part of a rural unit. Table 2 shows a classification of the Soil Bank cooperators. It shows the level of cooperation, whether whole or part units were enrolled, and the type of unit in terms of organization and amount of farming activity.[5]

These classifications sort the more commercial type of farm unit from the part-time farms and establish the number of rural residences or rural land holdings. Table 2 also shows the organization status as of 1940 and 1955 of the units enrolled in the Program. This gives some insight into the type of resource that was attracted to the Soil Bank Program.

Table 2 indicates that few commercial farm operations at the time of enrollment are included among the Soil Bank units. Of the 120 whole units, only 26, or 22 percent, could be classified as having 4 or more

---

[5] The organized unit was considered to be one whose owner manages the cultural practices of the land and uses this resource and some other farm resource for producing livestock or crops for sale or home use in addition to hay which might be sold standing. The unorganized unit was considered to be one whose owner is only a land owner and rents the land or sells hay standing.

**Table 2. Type of operation of Soil Bank cooperators at time of contract, related to type of unit operated, Coos County, New Hampshire, 1940 and 1955**

| Item | Level of cooperation and type of unit at time of contract | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Whole units | | | | | | | | Part units | | |
| | Total | | With 4 or more cows or equivalent | | Less than 4 cows or equivalent | | | | With 4 or more cows or equivalent | Less than 4 cows or equivalent | All units |
| | | | | | Organized* | | Unorganized† | | | | |
| | No. | Pct. | No. | Pct. | No. | Pct. | No. | Pct. | No. | No. | No. |
| Total units at time of contract | 120 | 100 | 26 | 22 | 9 | 8 | 85 | 71 | 5 | 4 | 129 |
| 1940 status: | | | | | | | | | | | |
| With 4 or more cows or equivalent | 76 | 63 | 21 | 17 | 7 | 6 | 48 | 40 | 5 | 1 | 82 |
| With less than 4 cows or equivalent: | | | | | | | | | | | |
| Organized | 9 | 8 | 2 | 2 | — | — | 7 | 6 | — | — | 9 |
| Unorganized | 35 | 29 | 3 | 2 | 2 | 2 | 30 | 25 | — | 3 | 38 |
| 1955 status: | | | | | | | | | | | |
| With 4 or more cows or equivalent | 35 | 29 | 26‡ | 21 | 1 | 1 | 8 | 7 | 4 | — | 39 |
| With less than 4 cows or equivalent: | | | | | | | | | | | |
| Organized | 14 | 12 | — | — | 8 | 7 | 6 | 5 | — | 1 | 15 |
| Unorganized | 71 | 59 | — | — | — | — | 71 | 59 | 1 | 3 | 75 |

* The organized unit is one whose owner manages the cultural practices of the land and uses this and some other farm resource(s) for producing livestock or crops for sale or home use in addition to hay which might be sold standing.

† The unorganized unit is one whose owner is only a land owner and rents his land or sells hay standing.

‡ Four poultry farms with land in Soil Bank included.

cows or their equivalent in terms of other livestock or crops at time of contract. Only 9 of the units that had less than 4 cows at time of contract could be classified as organized units. These units correspond to part-time farms. The largest grouping of cooperators were classified as unorganized units with less than 4 cows. There were eighty-five of these units, 71 percent of the units enrolled in the Program. Of these 85 unorganized units, 71 could be classified as unorganized in 1955 and 30 as far back as 1940.

The survey of independent operations in Coos County indicated that there were 631 rural units in 1959 (Table 3). This total included the 120 whole units enrolled in the Soil Bank Program, 309 units with 4 or or more cows or their equivalent, and 202 rural units with less than 4 cows or their equivalent. Of the 202 less than commercial sized units, 112 were classified as organized and 90 as unorganized.

**Table 3. Number and proportion of rural units in various categories, pre- and post-Soil Bank Program, Coos County, New Hampshire**

| Item | Total | With 4 or more cows or equivalent | Less than 4 cows or equivalent | | Soil Bank cooperators* |
|---|---|---|---|---|---|
| | | | Organized | Unarganized | |
| Pre-Soil Bank: | | | | | |
| Number | 631 | 335 | 121 | 175 | 0 |
| Percent | 100 | 53 | 19 | 28 | 0 |
| Post-Soil Bank: | | | | | |
| Number | 631 | 309 | 112 | 90 | 120 |
| Percent | 100 | 49 | 18 | 14 | 19 |
| Difference: | | | | | |
| Number | 0 | 26 | 9 | 85 | 120 |

* Excludes 9 part farm Soil Bank cooperators since they are included in some other rural unit classification.

Table 3 shows a comparison of the number of units in the several categories as they appeared after the three years of Soil Bank enrollment, and an estimate of the agricultural units as they would have been classified prior to enrollment, had enrollment occurred in one year. The Program reduced the units with 4 or more cows or their equivalent from 53 to 49 percent of the total units. Of the organized units with less than 4 cows, the Program changed their relative importance from 19 to 18 percent. The unorganized units with less than 4 cows were the most numerous participants in the Program and their importance decreased from 28 to 14 percent of all units. Soil Bank units accounted for 19 percent of the total units. Since such a large proportion of the Soil Bank enrollments were unorganized farm units, little effect on agricultural output might be expected from the Program.

The comparison of pre-Soil Bank and post-Soil Bank numbers and proportions of rural units in Table 3 was based on the assumption that there would have been no change in the farm economy had there been no Soil Bank Program. This assumption is not valid. Historically, commercial farm operations have declined in number and expansion of farm oper-

ation by remaining farmers has not taken up all the cropland released. Unorganized units have been disappearing with the cropland reverting to woods. A realistic view of the effect of the Program must include current trends.

Since dairying is the predominant enterprise in the County, trends in the dairy farm sector represent dominant trends in the area. From 1940 to 1959, the number of herds dropped from 746 to 345, an average of about 21 herds per year (Appendix Table 2). If only herds with 4 or more cows are considered, the average herd loss over the 19-year span was 17 herds per year. This rate of decline parallels closely the rate determined from Agricultural Census farm numbers for the period 1949-54.[6] Commercial dairy farm units declined by 88 over the 5-year period. The average decline is 18 commercial units per year.

By assuming that an annual decline of 18 farms (with 4 or more cows or equivalent) would occur during the time span of the Program, it is possible to appraise its net effect on commercial type units. Twenty-four of the 26 units with 4 or more cows or equivalent were enrolled in the 1959 Program (Appendix Table 3). In addition to these operations, 6 other farms ceased operation but did not enroll in the Program. This makes a total of 30 farms which either stopped or underwent abrupt changes in operation in 1959. Four of the 24 enrolled farms were poultry farms, which continued operation after enrollment, and 2 were cattle operations, which continued operation on a modified scale after enrollment. Two other cooperators changed farms. If 18 farms normally would be expected to stop operation each year, the maximum net effect of the Program in reducing commercial farm numbers would be 12 commercial-type units. But the probability that just 18 farmers would cease operation in any one year is exceedingly small. During many of the years over which the trend was established, at times no or very few farmers would have ceased operations, and during other select years, large numbers (50 or more) would have ceased operations. There is insufficient information for stating more definitely the number of farms that would have ceased operations during 1956-59 in absence of the Programs. It is clear that the effect of the Program on farm numbers is something less than the 24 commercial units enrolled. The best available evidence indicates it to be about 10 commercial sized units.

## Cropland on Enrolled Units

Roughly 17 percent, or 5,204 acres, of Coos County cropland was enrolled in the Program (Appendix Tables 4 and 5). Of this acreage, 76 acres were enrolled by operators as parts of units, 1,889 as whole units by farmers operating on a commercial basis, and 3,239 acres as whole units by other landowners. As with rural units discussed in the preceding section, the bulk of the cropland was enrolled in the 1959 Program. About 75 percent of the cropland and 75 percent of the farm units were enrolled in 1959.

The effect of the Program on land employed in farm production can be pictured as in Figure 1, which showed changes in acreage of cropland

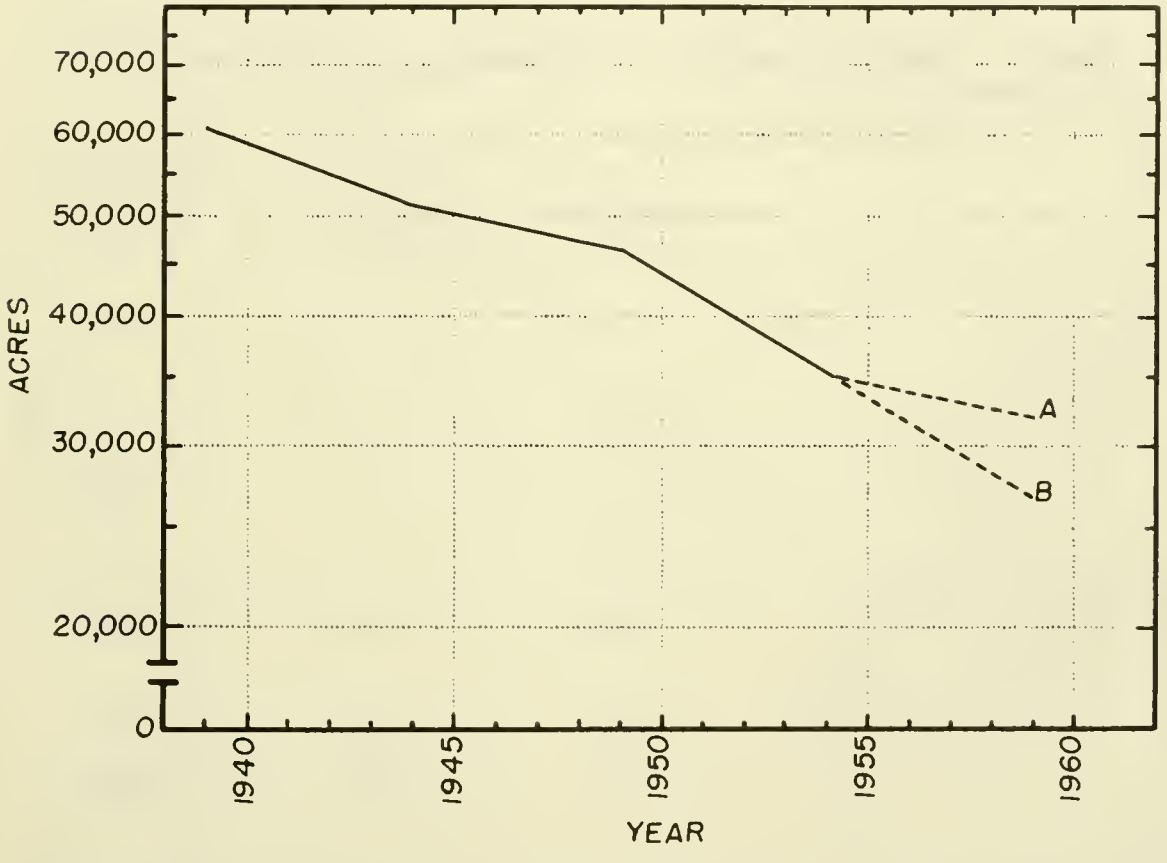
---

[6] See *1950 Agricultural Census* and *1954 Agricultural Census*, Bu. of the Census U. S. Dept. of Commerce.

from 1939 to 1954 and projections to 1959 with and without effects of Soil Bank. Acres are plotted on a logarithmic scale so the slope of the line expresses the rate of change. Assuming that the 1949 to 1954 rate of decline in cropland harvested and cropland pasture was representative of what would have happened between 1955 and 1959 had there been no Soil Bank Program (line B), then it would appear that the Program had little or no effect on cropland used for agricultural production. This is demonstrated graphically by the lower broken line B in Figure 1 connecting the 1954 Census acreage data with the estimated acres of cropland in Coos County aside from the acreage in the Program in 1959.

Other rates of decline also can be used for appraising the effect of the Program on cropland acreage. Assuming the 1944-49 period rather than 1949-54 period as the typical rate of decline, conclusions as to the effect of the Program would be considerably different, as the Program would then appear to be very effective in reducing acreage of cropland. This is demonstrated in Figure 1 when the 1954 acreage of cropland reported

**Figure 1. Changes in total cropland acres, 1939-54, and projections to 1959, Coos County, New Hampshire***




A. Connects the 1954 Census acre total with the 1959 acre total constructed from the town property lists of cropland including those acres that went into the Conservation Reserve.

B. This line is an extension of the same rate of change that occurred between 1949 and 1954 and connects the 1954 Census acre total with the constructed 1959 acre total minus the acres that went into the Conservation Reserve.

* Data 1939-54 from *Agricultural Census*, Bu. of Census, U. S. Dept. of Commerce; and 1959 data estimated from farm survey.

by the Census is connected with the estimated 1959 acreage *including* land enrolled in the Program (line A). On close inspection, this line expresses the same rate of change in cropland acreage that was experienced between 1944 and 1949.

The difference between the two cropland observations in 1959 is the 5,204 acres enrolled in the Soil Bank. Both observed points thus are related to the 1954 Census acreage by a rate of change in cropland which has been experienced in the last 1½ decades. This points out how the Program could be considered as 100 percent effective or as 100 percent ineffective as a reducer of cropland employed in farm production.

However, in making an appraisal of the Program's effect on cropland, it should be remembered that 1,889 acres were enrolled by farmers operating on a commercial basis and 228 acres by farmers operating on less than a commercial basis. Although these independent farm operations might have ceased without the Program, crops produced from the land would have been harvested by an organized unit. In addition, 1,548 acres in unorganized units were rented by dairymen and woodsmen prior to the lands being enrolled in the Program. Most of these acres also would have continued to be harvested even though little or no return was received from them. (Table 4).

**Table 4. Cropland enrolled in Soil Bank, estimated expected usual abandonment and added acreage idled due to the Program by type of unit**

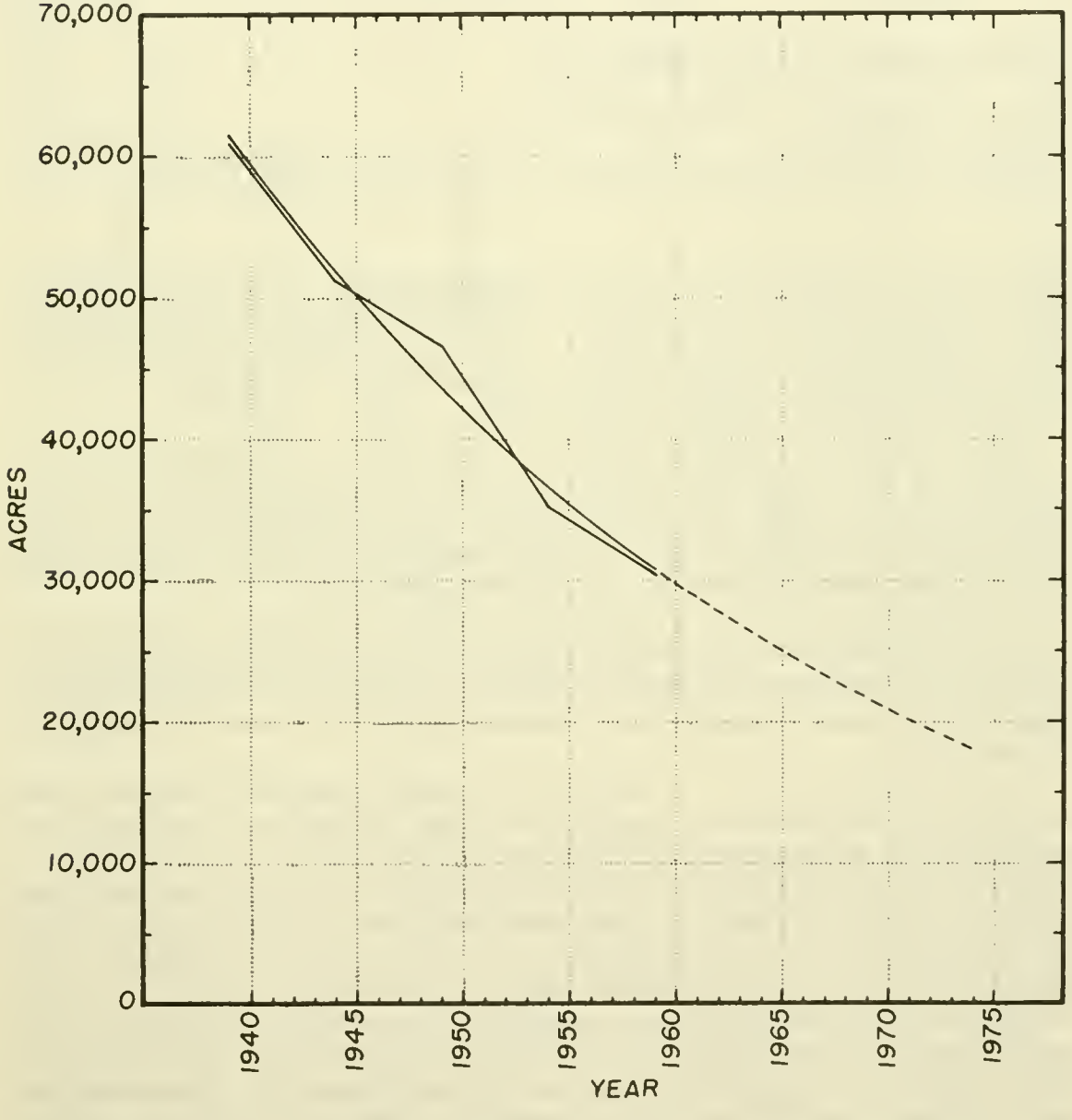
| Item | Actual acres enrolled in Soil Bank | Estimated acres expected to be abandoned | Estimated acres attributable, Soil Bank |
|---|---|---|---|
| Part units | 76 | 50 | 26 |
| Whole units: | | | |
| Organized — | | | |
| 4 or more cows or equivalent | 1.889 | 0 | 1,889 |
| Less than 4 cows or equivalent | 228 | 0 | 228 |
| Unorganized units — | | | |
| Rented or under lease before Soil Bank | 1,548 | 100 | 1,448 |
| Speculative or woodlot holdings and hay sold or cut for open market | 1,463 | 700 | 763 |
| Total | 5.204 | 850 | 4,354 |

The largest loss in cropland in lieu of the Program would have been from the 1,463 acres enrolled by owners of unorganized units who did not rent their land to a dairyman or woodsman prior to enrolling it. Ownership of these lands varied and the purpose for which they were held varied equally. Many of these land owners had purchased the cropland as parts of units with their primary interest in gaining title to woodlots. Other land owners had purchased land specifically for enrolling it in the Soil Bank Program. Essentially, the hay crop on this land was cut in

speculation of sale. Some of this land would have gone out of production had there been no Program.

A close inspection of individual Program cooperators indicates that the amount of land that would have reverted to brush by the summer of 1959 had there been no Program is about 850 acres. As shown in Table 4, it was estimated that the Soil Bank Program accounted for about 4,350 acres of cropland which would have remained in production at least through 1959 had there been no Program. The plausibility of this conclusion is supported by the trend comparison pictured in Figure 2. The sum of the remaining cropland not in the Soil Bank plus the 4,350 acres taken out of production by the Soil Bank almost falls on the 1939-59 trend in cropland as reported by the various Census of Agriculture.

**Figure 2. Long-run trend in cropland and projection, 1939-1975, Coos County***




* Data 1939-54 from *Agricultural Census*, Bu. of Census, U. S. Dept. of Commerce, and 1959 data estimated from Farm Survey. Trend fitted by method of least squares. Log. Y=4.867—.076X, where Y equals acres and X equals time.

## Livestock on Enrolled Units

A total of 418 milk cows were on units enrolled in the Program. However, this does not mean that 418 cows were removed from the County. Thirty-five cows were retained on enrolled farms and drylot fed, and 37 were moved to some other farmstead (Table 5). A total of 81 cows in-

**Table 5. Number of cows on Soil Bank units, disposition of cows and estimated number removed due to the Program, Coos County, New Hampshire**

| | |
|---|---|
| Total number of cows on Soil Bank Units | 418 |
| Still owned | 35 |
| Changed farms | 37 |
| Total | 72 |
| Corrected number of cows on enrolled units | 346 |
| Expected decline due to non-Soil Bank forces | 151 |
| Number of cows removed from production due to the Soil Bank Program | 195 |

volved in the Program were sold as replacements to other farmers in the County. These replaced stock normally sold as replacements to local dairymen, and therefore would represent a net loss. Including the cows sold to dealers and other local farmers, the maximum net impact in terms of cow removals is estimated to be 346.

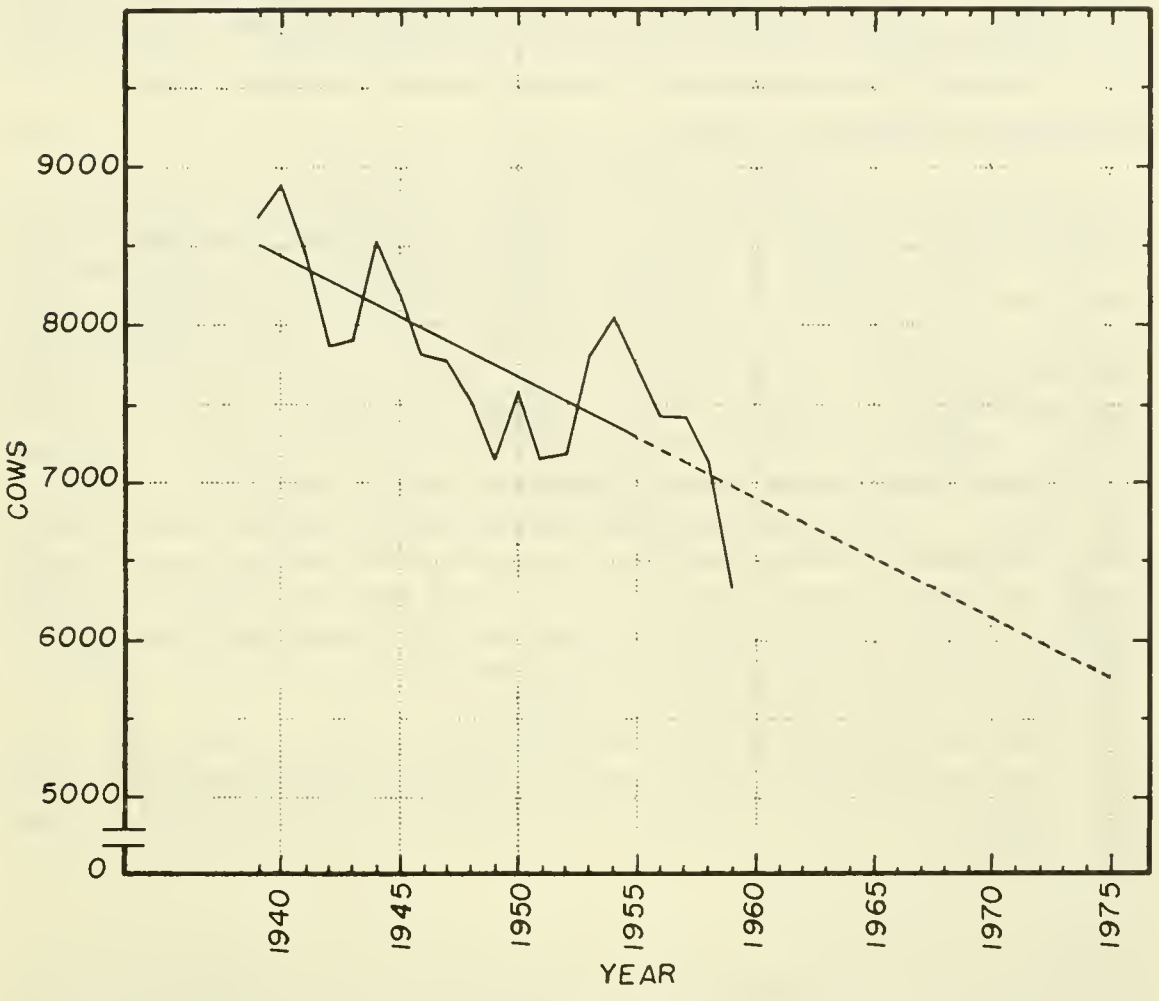
Sizable year-to-year fluctuations in cow numbers are experienced by the County, and it is within this framework that the changes in cow numbers attributable to the Soil Bank should be appraised. The trend in cow numbers should be considered also, as they reached their peak in 1920 and the trend has since declined at a fairly constant rate.

The 1939-59 trend in cow numbers is shown graphically in Figure 3. Cow numbers increased in 1952, 1953 and 1954, but since then have decreased. The expansion of cow numbers is traceable to the farmers' response to the more favorable price relationships that occurred during the Korean War.

The long-time trend in cow numbers and the downward trend in farm numbers suggests that some number less than the 346 cows removed on enrolled units represents the net effect of the Soil Bank on cow numbers. Each enrolled farm unit was examined carefully in order to estimate the net effect of the Program on cow numbers. Including all types of units that had cows at time of enrollment, it is estimated that the Program was responsible for a reduction of 195 cows.

While the Soil Bank Program influenced cow numbers in the County, the magnitude of the change was not particularly large when compared with year-to-year changes experienced in the 1950's. The expansion in cow numbers from 1952 to 1953 amounted to 649, three times the change attributable to the Program. Between 1955 and 1956, cow numbers were reduced by 307 cows, somewhat more than the number attributable to

**Figure 3. Long-run trend in cow numbers and projection, 1939-1975, Coos County***




* Data 1939-58 from town tax records. 1959 data estimated from Farm Survey. Trend fitted by methods of least squares. Y=8567.13—76.03X, where Y equals cow numbers and X equals time. r=.76, S=397.

the Soil Bank. Thus annual fluctuations in response to general economic conditions were at least as severe in changing cow numbers as was the Program.

## Machinery on Enrolled Units

Thirty-seven of the 120 whole unit Soil Bank cooperators reported farm machinery of some sort (Appendix Table 6). This machinery varied in type from horse-drawn and virtually unusable pieces to high-capacity items of recent vintage. In order to get a meaningful idea of the volume of machinery involved, tractor numbers were analyzed on an age basis. Employing a useful life expectancy of 16 years. the estimated new tractor life of the 34 tractors on Soil Bank units was 18 medium-sized tractors. When no obsolescence is assumed on these tractors, the equivalent of 18 new tractors would be released from farm production. This is roughly three-fourths of one year's tractor replacements on the farms remaining in production in the County. As discussed previously, farm numbers and acreage of cropland have been declining. The same type of situation would pre-

vail with machinery in that not all of the equipment idled on enrolled Soil Bank units could be attributed to the Program. A study of individual units enrolled indicates that the net effect of the Program on tractor numbers was to free the equivalent of 12 new tractors for use by remaining agricultural units.

### Buildings on Enrolled Units

A total of 67 units of the 120 whole unit cooperators had some kind of farm buildings (Appendix Table 6). Some 38 buildings were barns 30 by 60 feet or larger. Many of the barns were in poor repair and bordered on obsolescence. In order to appraise farm buildings, the following crude guides were used: repairs made in the last 5 or 10 years; type of floor material in the cow tieup portion of the barn. About 70 percent of the farm buildings were found to have received no improvements in the stable area to conform to modern technology. The measure of repairs made during the last decade gives some indication as to the intentions of operators with regard to future agricultural production using their building capacity. About 30 percent of the buildings on units idled received some repairs during the last 10 years and only 16 percent had any repairs completed during the last 5 years. These measures are very crude but they do indicate that most of these buildings did not meet current standards of efficient operation and low-cost production of milk.

Not all the whole units enrolled reported a dwelling. Only 80 homes were reported on the 120 whole units. Of the 80 homes reported, 78 per cent were used as year-round homes and 22 percent as part-time or summer residences.

### Labor on Enrolled Units

Persons of all occupations were cooperators in the Soil Bank Program. Besides farmers, local businessmen, ministers, doctors, undertakers, and town administrators are included. Even though 120 whole units were enrolled, relatively few workers were released to the labor market. Among the 26 commercial units enrolled, 10 operators had nonfarm jobs before enrollment (Table 6). After enrollment in the Program, the net effect was to increase the number of persons seeking nonfarm work by four. In an area where nonfarm employment exceeds 10,000 persons, this amount of labor released is negligible (Appendix Table 7).

### Summary of Resources Enrolled in the Soil Bank

Several things are demonstrated by the preceding analysis of the resources enrolled in the Program and the agricultural trends that have characterized production in Coos County. First, forces other than the Soil Bank have had equally as great and probably a greater impact on the use of resources as has the Soil Bank. Second, many of the resources involved on units enrolled in the Program are of relatively poor quality. Because of this, one would expect the operators of these units to be ready to accept a less intensive agricultural use or complete abandonment from agricultural use. Third, many parcels of the land resource and its product, hay, received little or no income before the Program. Land rents or payments for hay were nominal or nonexistent for many of the smaller holdings that

qualified for the Program. Specifically, the following concise estimates can be made of the resources enrolled in the Soil Bank in the period 1956-59.

**Table 6. Present and pre-Soil Bank employment status and number of persons seeking non-farm employment from 26 whole units with 4 or more cows or equivalent enrolled in the Program**

| | Units |
|---|---|
| **PRESENT EMPLOYMENT STATUS** | |
| Retired or widowed | 8 |
| Changed farm, still farming, cattle dealer | 8 |
| Painter, carpenter, plumber | 3 |
| Mill work (including saw mill) | 3 |
| Junk dealer | 1 |
| Odd jobs | 3 |
| Total | 26 |
| **PRE-SOIL BANK EMPLOYMENT STATUS** | |
| Number with non-farm jobs | 10 |
| Number without non-farm jobs | 16 |
| Total | 26 |
| **CHANGE IN LABOR FORCE** | |
| Number seeking non-farm jobs not previously working in agriculture* | 4 |

* Net figure after adjustments for combination of non-farm work and retirement.

*Unit Numbers.* A total of 120 whole units and 9 part-units were enrolled in the Soil Bank. Of the 120 whole units enrolled, only 26 could be classed as commercial units, and even then, 10 of the operators of these units held nonfarm jobs before enrolling. Most of the units enrolled were operated as part-time farms or merely held as rural properties selling hay. Many were not actively farmed as complete units as far back as 1940. Financially, the Program was a better alternative for owners of these lands than renting to farmers in the area at little or even no return. Seventy-nine percent of the whole units enrolled were these noncommercial type rural units. Many of these rural units would probably still be producing hay for sale or be used by local farmers if there had been no Program.

It is more difficult to estimate how many of the 26 commercial-type units enrolled in the Program would still be in operation as farms had there been no Program. During the last few decades, the annual attrition rate in farms has averaged about 18 per year. The fact that several of the operators who enrolled retired upon joining the Program would indicate that at least some of the operators would have left agriculture, although the farms as such might have continued with new managers. From a careful study of farm records and trends in the area, it is estimated that the Program removed about 10 farms that would otherwise still be in operation.

*Cropland.* A total of 5,204 acres were enrolled in the Program. This is 17 percent of the cropland in the County. Of the whole farms enrolled, the total acreage amounted to 5,128 acres. Sixty-three percent of this

acreage was on holdings generally classed as noncommercial farms. As pointed out in the section on farm numbers, many of the smaller holdings with the lower levels of land productivity change gradually from cropland into woods. Eventually, the cost of harvesting the hay crop exceeds the value of the hay, and the land remains idle. Had there been no Soil Bank Program, it is estimated that 850 acres of land in this category would have been abandoned for cropland use during the period the Program was in operation. The cropland on the more commercial type of unit whether enrolled in the Soil Bank or normally idled would have stayed in the agricultural system of the County because of its relative level of productivity. The net effect of the Program in terms of cropland idled and removed from production is estimated to be about 4,350 acres.

*Livestock.* While 418 cows were on units enrolled in the Soil Bank, this number does not represent the net cow removals associated with the Program. Seventy-two cows remained in farmer ownership after the units were enrolled. This leaves a net of 346 cows which were essentially eliminated from production by the Soil Bank. However, as with land and farm numbers. economic forces have caused a downward trend in cow numbers in the County. This would modify the estimate of the effect of the Program on cow numbers. An examination of each farm unit enrolled in the Program was made to estimate the true net effect of the Program on cow numbers. Taking into account the animals that would have left production had there been no Soil Bank Program, 195 cows were estimated to have been removed from the County because of the Program.

*Machinery.* Only 37 of the 120 whole unit Soil Bank Cooperators reported farm machinery of any type. The machines reported varied considerably in both age and usability. Some equipment was of horse-drawn vintage and had little resale value while some was relatively new. Tractor numbers adjusted for age of a 16-year life was used as an indicator of machinery released by the Program. Taking into account the individual farms that would have stopped production had there been no Soil Bank Program, it was estimated that the Program freed for sale the equivalent of 12 new tractors.

*Buildings.* Of the 120 whole units enrolled, 67 had farm buildings of some kind and 80 had dwelling houses. About 78 percent of the dwellings were used year-round. While the dwelling has some importance in terms of an agricultural resource, when the farm buildings are destroyed by fire or other cause it has often meant the cessation of farming on individual units. Historically, this has been the case, and almost half of the units enrolled had no farm buildings. Of the buildings on units enrolled, many were in rather poor repair and technologically obsolete. For these reasons and the fact that buildings generally must be associated with particular land holdings, no economic values or inferences can be obtained from the buildings idled by the Program.

*Labor.* As shown elsewhere, most of the units enrolled in the Program were not full-time commercial farms. Of the 26 units with reasonably full-time employment, 10 persons had nonfarm jobs before enrollment. Others remained in agricultural work and the net effect of the Program was to increase the persons seeking nonfarm work by four. This is considered to be a negligible effect on the resource pattern of the County.

## EFFECT OF THE SOIL BANK ON THE ECONOMY

The effect of the Soil Bank Program on the economy of Coos County can be determined by measuring the Program's effect on gross farm income, income flow, change in expenditure pattern, and nonparticipating farmer's incomes and costs of production.

### GROSS FARM INCOME ESTIMATES

The effect of the Program on farm income is analyzed by comparing the income expectation from land resources enrolled in the Program with an estimate of income that might have been derived from these resources had they not been enrolled in the Program.

Economic theory suggests that operators of individual units would improve their net income by enrolling their land resources in the Program and hence explains why operators enrolled. Preliminary budgeting confirms this hypothesis. This, coupled with the fact that the Program has been put into operation, reduces the areas for study to the effect on the remaining farm economy and on the local nonfarm economy, which includes the agencies that serve agriculture.

Future income from the land resource enrolled in the Program is predicted from data furnished by the State Agricultural Stabilization and Conservation Service. The land resource enrolled in the Program as of July 1, 1959, is assumed to be held under contract until the contract expires. The estimates take into account the extension of income flow from the 1956-59 Program through 1972. Ten-year contracts involving tree-planting operations may be extended if trees are not available for planting.

Predicting what the future income flow from enrolled resources involved in enrolled units might have been in the absence of the Program is more difficult. Predicting income for the year 1959 can be done with some degree of accuracy, given a realistic set of basic assumptions. Predicting income for any ensuing year is impossible because of the many forces that modify prices and farm production decisions. The income prediction for resources on enrolled units in the absence of the Soil Bank Program is presented as an indication of income flow over the entire 10 to 12 year period and not as a prediction of income in any specific year. It is based essentially on the assumptions that current trends continue over the next decade.

#### Method of Analysis

To facilitate the analysis, two models of agricultural resource use and output and therefore income projections are developed. These models represent likely extremes in resource use and provide precise enough answers to permit some analysis of the Program's impact on the farm economy.

The assumptions common to both levels of analysis are:

*Prices.* Prices typical in the last few years are assumed to continue through 1972. As with other assumptions, these prices may not truly represent those which will occur regularly. However, they are consistent in that the prices paid-prices received ratio is that which is anticipated.

*Production output and input rates.* Specific production rates used to determine quantities of agricultural output are shown in Appendix Table 8. Possible changes in technology that would influence rates of output over the period studied are largely ignored. Milk production per cow is the exception in that it is assumed that an average annual increase of 110 pounds per cow would be experienced. This annual increase in production per cow has occurred rather consistently over the last several years. Part of this increase has been attributed to changes in input qualities. However, it is felt that most of the increase is due to quality improvements in livestock rather than input changes. Also, the cows in the enrolled resources were at a low enough production level to participate easily in such a low average annual increase. With stable price relationships, crop yields are not assumed to be increased. Furthermore, it is felt that technology will have little effect on crop yields in the short time span involved.

The assumptions that differ for the two levels of analysis are:

*Quantity of resources.* The basic difference in computing the two levels of income is quantity of resources assumed to remain in production over the period of analysis. For the low-income estimate, resources removed by the Soil Bank are assumed to be completely idled from production by the year of expiration of the 1959 extended contracts, even though they had not been enrolled in the Program. The actual output-producing resources of cows and cropland were assumed to decline or be idled by a constant amount each year. Thus by 1972, production from the resources is assumed to have stopped. Essentially this analysis assumes that the resources involved were inferior to resources not enrolled in the Soil Bank. For the high income estimate, resources estimated to have been taken out of production by the Program are assumed to be idled from agricultural use at the same rate as expected for all other County resources, as shown in Figures 2 and 3. This is saying that the resources enrolled in the Program are equal in quality to comparable remaining resources in the County. The exact quantities of resources used in both levels of analysis are shown in Appendix Tables 9 and 10.

## Comparative Income Estimates

*High Income Model.* The high gross income expected to have been earned by resources idled by enrollment indicates the largest loss in farm income to the Coos County farm economy. This income loss-Soil Bank comparison is shown in Table 7. It is estimated that in 1959, these resources would have earned $117,480 gross income for the Coos County farm economy if there had been no Program. This gross income was foregone to obtain $94,000 gross income from Soil Bank payments for a net loss in gross income of something less than $25,000. In the remaining 13 years of the contract, $1,203,915 gross income would be foregone from idling resources from farm production for $917,000 of Soil Bank payments. The loss in gross income over the 13 years is slightly greater than an average of $22,000 per year.

The hay that was produced on Soil Bank farms and sold locally represents no loss in income to the County. These sales effect expenditure patterns and costs of the remaining farmers and is considered in a later section. Agricultural Conservation Program payments are expected to re-

**Table 7. High gross agricultural income expected to be earned by resources idled by the Soil Bank Program, compared to Soil Bank payments, 1959 and 1960-72**

| Item | Unit | Without program: Quantity | Price per unit | Returns | With program: Item | Returns |
|---|---|---|---|---|---|---|
| | | | | 1959 | | |
| Milk | cwt. | 13,460 | $ 4.50 | $ 60,570 | Soil Bank Payments | |
| Cull cows | no. | 56 | 150.00 | 8,400 | Incentive | $ 82,000 |
| Calves | no. | 79 | 10.00 | 790 | Practice | 12,000 |
| Hay | a ton | 2,386 | 20.00 | 47,720 | | |
| | b ton | 1,860 | 5.00 | —* | | |
| ACP | acre | 4,350 | 4.00 | —* | | |
| | | | | $117,480 | | $ 94,000 |
| | | | | 1960-1972 | | |
| Milk | cwt. | 151,379 | $ 4.50 | $681,205 | Soil Bank Payments | |
| Cull cows | no. | 582 | 150.00 | 87,300 | | |
| Calves | no. | 823 | 10.00 | 8,230 | Incentive | $869,000 |
| Hay | a ton | 21,359 | 20.00 | 427,180 | Practice | 48,000 |
| | b ton | 16,667 | 5.00 | —* | | |
| ACP | acre | 40,172 | 4.00 | —* | | |
| | | | | $1,203,915 | | $917,000 |

* Represents no change in income flow into the County. Hay sales are inter-farm transactions within the County. Agricultural Conservation payments are determined institutionally and do not necessarily change in total for the County.

main the same as they were before the Program because of the way in which payments are determined and distributed. A.C.P. appropriations made by the Congress are divided among the states on the basis of farm resources and conservation needs. State committees divide the funds among counties on a similar base with volume of applications for practice payments as an indication of Conservation needs. Farmers in Coos County have consistently applied for more A.C.P. assistance with conservation practices than funds were available to support. Remaining farmers are thus in a position to obtain larger payments over the ensuing years, as there are fewer operators to share the limited funds.

*Low Income Model.* The low gross income expected to have been earned by resources idled by enrollment, if they had not been enrolled, indicates the smallest loss in farm income due to the Soil Bank (Table 8). The effect of the Program on 1959 farm income under these assumptions are the same as those for the high expected income. However, over the remaining contract period, under the low-income estimate, $731,885 income is foregone by enrolling the land resource in the Soil Bank Program for the $917,000 Soil Bank payments. Gross income is then expected to increase by an average of about $14,000 per year if the assumptions that underlie the low estimate properly describes economic conditions in the following years.

**Table 8. Low gross agricultural income expected to be earned by resources idled by the Soil Bank Program, compared to Soil Bank Payments, 1959 and 1960-72**

| Item | Unit | Without program: Quantity | Price per unit | Returns | With program: Item | Returns |
|---|---|---|---|---|---|---|
| | | | | 1959 | | |
| Milk | cwt. | 13.460 | $ 4.50 | $ 60,570 | Soil Bank Payments | |
| Cull cows | no. | 56 | 150.00 | 8,400 | Incentive | $82,000 |
| Calves | no. | 79 | 10.00 | 790 | Practice | 12,000 |
| Hay | a ton | 2.386 | 20.00 | 47,720 | | |
| | b ton | 1,860 | 5.00 | —* | | |
| ACP | acre | 4.350 | 1.00 | —* | | |
| | | | | $117,480 | | $ 94,000 |
| | | | | 1960-1972 | | |
| Milk | cwt. | 86,736 | 4.50 | $390,315 | Soil Bank Payments | |
| Cull cows | no. | 337 | 150.00 | 50,550 | | |
| Calves | no. | 474 | 10.00 | 4,740 | Incentive | $869,000 |
| Hay | a ton | 14,314 | 20.00 | 286,280 | Practice | 48,000 |
| | b ton | 11,157 | 5.00 | —* | | |
| ACP | acre | 26,100 | 1.00 | —* | | |
| | | | | $731,885 | | $917,000 |

* Represents no change in income flow into the County. Hay sales are inter-farm transactions within the County. Agricultural Conservation payments are determined institutionally and do not necessarily change in total for the County.

## Discussion of the Models

The high- and low-income estimates refer to synthesized anticipated incomes from resources involved on units now enrolled in the Soil Bank. This assumes also that these resources had not been enrolled in the Soil Bank and that economic forces were allowed to influence resource use and output. The high estimate assumes resources enrolled were average for the County and the low estimate assumes that resources were substantially below average for the County. A careful examination of the resources enrolled in the Program and discussed earlier in this study indicates that as a group the enrolled resources could not be considered above the average quality. This conclusion is drawn, even though some resources were of highest quality.

The comparison of gross income potentials indicates that gross farm income would fall by slightly less than $25,000 for the year 1959 because of enrollment in the Program. In the following years, gross farm income is estimated to average either $22,000 less or $14.000 more per year then it would have had there been no Program.

The differences in gross agricultural income between the models is not particularly significant if viewed in the proper perspective. With an average range of from —$22,000 to +$14,000, the gross difference between models is only $36,000. This difference of $36,000 is equivalent to a change in the average annual price of milk of about 8½ cents per hundred-weight for the producing herds of the County. Or, this amount of income is equivalent to the income from about 100 cows. Hence, the Soil Bank participation does not seem to have affected appreciably gross agricultural income to the County.

## INCOME FLOW IN THE LOCAL ECONOMY

The Coos County economy is basically an isolated one. The County is bordered on the east, south, and west by mountains and rough terrain. It is bordered on the north by Canada. Farming is carried on in valleys of the Connecticut River, the Androscoggin River, tributaries of these two rivers, on rolling hills of the famed Colebrook area, and on rolling and sometimes rocky hills around Lancaster. Recreation and wood industries are the basis for the nonfarm economy. Although people living in parts of Maine, Vermont, Canada and other parts of New Hampshire use towns in Coos County as a market area, the contribution of these other areas to the County economy is not great because of the sparse population.

Output for local use is confined to a modest amount of wood and food products, and to personal, retail, and recreational services. Demand in the area can be broken down into two parts: Demand for goods and services produced in the area, and demand for goods and services produced outside the area. Supply in the area can likewise be broken into two parts: Supply of goods and services for local demand; and supply of goods and services for consumption elsewhere. A reduction in the latter means a reduction of the income flow into the area. A reduction of income flow into the area would also mean a reduction in demand for local production.

### Income Flow Model

Assume that a dairyman produces a dollar's worth less milk (Table 9). This means that he has one dollar less to spend. Suppose further, that he decides to spend one dollar less for coffee for the family. Obviously no coffee beans are produced in the area. But the services that bring the coffee into the area, store it, and transfer it to the farmer are produced in the area. The price of these services is called the retail markup. Let us assume that this markup is 30 percent. Thus the demand for goods and services produced in the area falls by an amount equal to 30 cents and the fall in demand for goods produced outside the area equals 70 cents. The 30 cents received by the grocer for his service represents income to him, and the reduction in the farmer's expenditure means a 30-cent loss in income to the grocer. The grocer must curtail his expenditures by 30 cents. Assume now that the grocer cuts 30 cents from his expenditure for shoes and that the markup on shoes is also 30 percent. The expenditure for the local service of providing shoes falls by an amount equal to 9 cents, and the expenditure for shoes produced outside the area falls by an amount equal to 21 cents. This process continues until the expenditures for goods produced outside the area equals the $1.00 lost by the dairyman. The loss in outflow of dollars then equals the loss in inflow of

**Table 9. Effect on income flow and income recipient resulting from a one dollar change (loss) in payment for agricultural commodities produced in Coos County and sold outside the County***

| Kind of transaction | Transaction number | Amount of transaction | Gross income | | Amount of expenditure for goods and services produced | | Money flow | |
|---|---|---|---|---|---|---|---|---|
| | | | Farm | Non-farm | In the County | Outside the County | Into County | Out of County |
| Milk payment to farmer | 0 | $1.00 | $1.00 | — | — | — | $1.00 | — |
| Farmer's expenditure for coffee | 1 | 1.00 | — | $1.00 | $0.30 | $0.70 | — | $0.70 |
| Groceryman's expenditure for shoes | 2 | .30 | — | .30 | .09 | .21 | — | .21 |
| Shoe store owner's expenditure | 3 | .09 | — | .09 | .027 | .063 | — | .063 |
| ..... | 4 | .027 | — | .027 | .0081 | .0189 | — | .0189 |
| ..... | 5 | .0081 | — | .0081 | .0024 | .0057 | — | .0057 |
| Approximate total after many transactions .... | | 2.43 | 1.00 | 1.43 | .43 | 1.00 | 1.00 | 1.00 |

* Assumes that the County demand for goods and services produced in the County equals 30 percent of the total demand. This is the weighted average for imported items which approximate 20 percent and local services which approach 100 percent.

dollars coming into the area. However, the flow of dollars within the area is reduced by $1.43.

### Income Flow within the County

The change in the inflow of income into the County is essentially the net change in gross farm income. The estimated change in gross farm income for both the high and low resource use estimates for the year 1959 is $23,480. The final impact of this reduction in gross farm income will depend on the demand for local goods and services. If this demand is 30 percent of total demand in the area, and all income is spent in the area, then the income flow within the area will be reduced by $1.43 for each dollar lost in gross farm income for a total reduction of $33,600 due to the Soil Bank for the 1959 year. The loss in income to owners of nonfarm resources is estimated to be about $10,000 as the effect of the change in gross farm income spreads with each transaction throughout the economy. If the complete loss in income were to be absorbed by a few individuals in the nonfarm economy, the loss of $10,000 would amount to the annual wage of about 3 workers.[7]

For the remaining years covered by Soil Bank contracts, the amount of income loss for the high use resource estimate would remain the same as in 1959. But with the low resource use estimate conditions would differ. In this case, income to providers of local services would be increased by about $6,000 annually, equivalent to the creation of two additional jobs. However, not all money is spent in the area. Many purchases are made from mail order houses, and some income is saved and invested outside the area. Hence, the effect of the Soil Bank on the local economy would appear to be something less than the 3 job equivalents estimated for 1959.

The same conclusions would hold for the high resource estimate over the lifetime of the current contracts. If some of the change in gross income is not spent in the area, the increase for the low resource use estimate probably would not reach the level of $6.000 per year over the life of the Program. Further, if the demand for local services was something less than 30 percent of total demand, the impact would be less. The effect of the Program on income flow within the area, even when liberally computed, appears to be negligible.

### Expenditure Patterns

In a previous section, two agricultural resource use models were developed to show the impact of the Program on gross farm income. For the high resource use model, the immediate income loss is estimated to be about $23.000, while the average annual decrease in income from 1960-72, was estimated to be about $22.000 below the level that would have existed had there been no Program. For the low resource use model, gross income would have declined during 1959 by the same amount as with the high income model. However, for the longer time period, it was estimated that the Program would have increased the gross income attributable to the enrolled resources by about $14,000 per year. The important conclusion was that the difference in income resulting from the Soil Bank

[7] However, it would be anticipated that the income effect would be spread out over individuals who provide services in the County.

Program is small when compared with possible changes in gross income for the County caused by changes in prices or cow numbers.

The change in farm expenditures also appears to be greater in magnitude than the changes in gross farm income. These changes are approximated in Table 10. For both the high- and low-income models and for both short- and long-run conditions, expenditures for living expenses or savings would increase substantially because of the Program. Naturally, with gross income relatively the same with or without the Program, and with no need for expenditures for operating and new capital goods, a shift in expenditure pattern from production goods to consumption goods would occur.

As shown in Table 10, expenditures for remaining farmers resulting largely from purchases of hay will increase under Soil Bank conditions but will not compensate for the large reduction in operating expenses associated with enrolled farms. Capital expenditures decline somewhat with the impact of the Program but require some outlay for real estate debt payments.

With the change in the income expenditure pattern anticipated with the Program, agricultural dealers and providers of agricultural services to farmers would feel a decline in gross income. However, providers of consumer goods and services would benefit considerably by the shift of agricultural units into the Soil Bank.

*In 1959.* Expenditures for both the low and the high resource use models are predicted to be the same in 1959. Expenditures for production goods would decline by $33,800, and this decline would be noticeable by local suppliers of agricultural production goods. Because of Soil Bank enrollment, expenditures of Soil Bank Cooperators for consumption goods would increase by $37,000 or by about 2 and ½ times the pre-Program amount.

*In the Long Run.* With the high resource use model, consumption expenditures would increase an average of about $23,000 annually from 1960-72. Farm operating cost expenditures would drop about the same amount on a yearly basis. This estimate includes the increased costs associated with the remaining farmers. Capital expenditures, which would be largely for debt retirement or real estate, would be down by about $13,000 per year.

With the low resource use model, long-run living expenditures would increase an average of about $33,000 per year above what they would have been had there been no Program. Operating expenses would have shown a negligible drop of about $4,000 annually. In other words, if the low resource use model closely fits the true resource structure, dealers who provide agricultural production goods and services would experience little reduction in gross income *caused by the Soil Bank enrollment.*

## NONPARTICIPATING FARMERS

### Hay Purchases

The major impact of the Program on nonparticipating farmers is in the influence it has on the hay supply. Many dairy operators supplement the hay supply produced on their own land. Often a neighboring field is rented or a stand of hay purchased. A close inspection of several towns indicates that a considerable amount of hayland formerly rented by dairy-

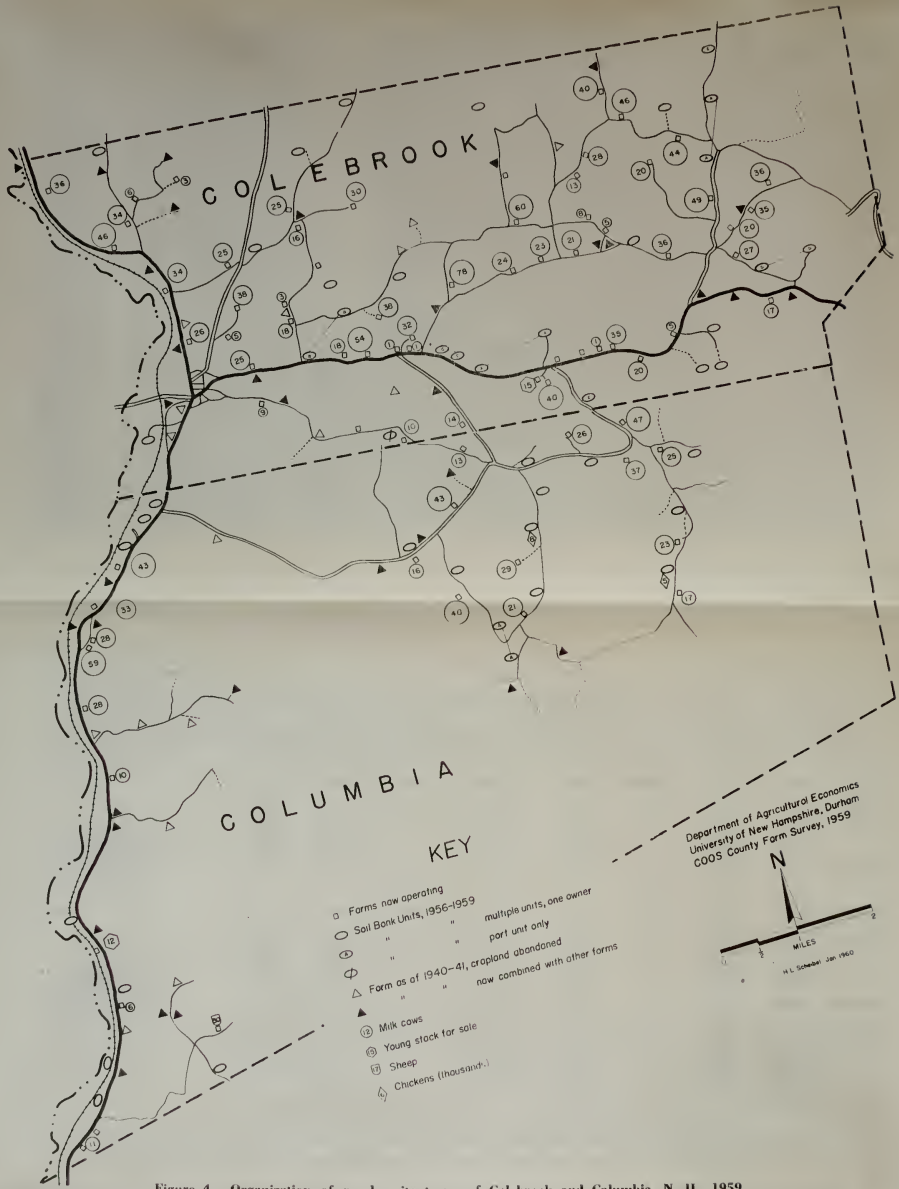



Figure 4. Organization of rural units, towns of Colebrook and Columbia, N. H., 1959

**Table 10. Change in farm expenditures growing out of enrollment in the Soil Bank Program***

| Item | 1959 expenditures | | | 1960-72 expenditures | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | | | Annual | | |
| | Without Soil Bank | With† Soil Bank | Diff. | Without Soil Bank | With† Soil Bank | Diff. | Without Soil Bank | With† Soil Bank | Diff. |
| | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars | Dollars |
| High resource use: | | | | | | | | | |
| Living expenses | 23,500 | 60,500 | +37.000 | 240,800 | 541,000 | +300,200 | 18,500 | 41,600 | +23,100 |
| Operating expenses: | | | | | | | | | |
| Cooperating units | 70,500 | 23,500 | — | 722,300 | 306,000 | — | 55,500 | 23,600 | — |
| Remaining farms‡ | 14,900 | 28,100 | — | 133,300 | 250,000 | — | 10,300 | 19,200 | — |
| Total | 85,400 | 51,600 | —33,800 | 855,600 | 556,000 | —299,600 | 65,800 | 42,800 | —23,000 |
| Capital | 23,500 | 10,000 | —13,500 | 240,700 | 70,000 | —170,700 | 18,500 | 5,400 | —13,100 |
| Low resource use: | | | | | | | | | |
| Living expenses | 23,500 | 60,500 | +37,000 | 146,400 | 571,000 | +424,600 | 11,300 | 43,900 | +32,600 |
| Operating expenses: | | | | | | | | | |
| Cooperating units | 70,500 | 23,500 | — | 439,100 | 306,000 | — | 33,800 | 23,500 | — |
| Remaining farms‡ | 14,900 | 28,100 | — | 89,300 | 167,300 | — | 6,900 | 12,900 | — |
| Total | 85,400 | 51,600 | —33,800 | 528,400 | 473,300 | —55,100 | 40,700 | 36,400 | —4,300 |
| Capital | 23,500 | 10,000 | —13,500 | 146,400 | 40,000 | —106,400 | 11,300 | 3,100 | —8,200 |

* Expenditure pattern is based on FHA farm and home accounts in Coos County. Analysis of these farms indicates 20 percent of gross income is spent for living expenditures, 60 percent for production expenses and taxes and 20 percent for durable production goods.

† Cost of upkeep, practices and taxes is assumed to be 25 percent of the Soil Bank payment.

‡ Based on $8 per ton, cash out-of-pocket operating cost to remaining farmers for hay purchased standing and on replacement of this hay when hay cost $20 per ton.

men is now in the Soil Bank. In the three towns of Colebrook, Columbia and Stewartstown, there were only 450 acres of land for rent in 1959, where as in 1958 there were 1,113 acres.

The loss of this hay is especially important because many fields were close to the renting farm. With this land in the Soil Bank, if the dairymen continue to rent, they must travel longer distances to obtain hay. Figure 4 shows the various rural units by type of operation and location within the townships of Colebrook and Columbia, New Hampshire. This figure graphically locates the Soil Bank cooperators as well as the potential renters or hayland. It can be seen that while the Program has taken many units that were on the "ends" of the road, it has also reduced the units that could supply "nearby" hay.

There are two other alternatives for obtaining hay supplies. First, some dairymen could obtain the supply from their own land by increased fertilization. Second, hay could be purchased on the market from other areas. However, if we assume that dairy farm forage programs were in balance before the Soil Bank, it follows that the hay supply lost in the Program can be replaced only at a greater cost to remaining dairymen. This increased cost to the remaining dairymen is an intangible cost to estimate. The two gross income models developed in a preceding section give us some indication of the quantities of hay the enrolled cropland was expected to produce for local use. In Tables 7 and 8, the hay lost to remaining farmers is estimated to be 1,860 tons for 1959. For succeeding years, the estimate is 16,667 tons under the high-resource use estimate and 11,157 tons under the low-resource use estimate. The cost of this hay is commonly $5.00 per ton, paid to the owner of the land resource, plus about $8.00 per ton out-of-pocket cost of harvesting and storing the hay.[8] Assuming that hay is purchased at $20.00 per ton, the increased cost of remaining dairymen who buy hay becomes $7.00 per ton. Thus the increased cost of hay to remaining dairymen would be about $13,000 for the year 1959. For the remaining years of the analysis, the cost of hay would be $116,700 under the high-resource use estimate and $78.100 under the low-resource use estimate.

## Economies in Marketing

Another problem affecting the remaining farmers is the availability of marketing facilities and services, and the cost of these services. Firms that service farms achieve certain economies of scale of operation as their volumes increase. This is the case whether the firms provide only goods to farms or whether they provide a combination of goods and services or merely services. Extensive land placement in the Soil Bank could mean a reduction in volume great enough to cause increased costs and lower net prices for items sold by farmers and higher net prices for items purchased by farmers.

The charges for retail services, machinery repair services, and the like are important to dairymen. However, in view of the number of firms in-

[8] These costs vary tremendously. "Rent" goes from no charge to $20.00 per acre, and the rent assumed here approximates the modal. Similar differences exist with operating costs. The $8.00 employed in the analysis approximates the mode and does not include return to family labor, management, or depreciation because each represent income to the farm family.

volved, the structure of these firms, the alternatives and the relative importance of agriculture to the overall economy, a change in demand for these services may mean some adjustment in firm reorganization with only infinitely small changes in the prices of the services. The major marketing cost affected is connected with milk hauling, and the analysis is restricted to possible changes in the economies associated with milk assembly. Towns of 200 or more cows were selected for preliminary analysis. As shown in Table 11, density of production was measured in terms

**Table 11. Cows per mile of road for town with a total of 200 or more cows, and Coos County, New Hampshire, 1959***

| Area | Cow numbers | | | Cows per mile of road | |
|---|---|---|---|---|---|
| | Total all herds | Herds with less than 16 cows | Herds with more than 16 cows | All herds | Herds with more than 16 cows |
| Clarksville | 271 | 55 | 216 | 21.5 | 17.1 |
| Pittsburg | 295 | 11 | 284 | 17.2 | 16.5 |
| Colebrook | 1284 | 90 | 1194 | 34.6 | 32.2 |
| Columbia | 519 | 34 | 485 | 25.3 | 23.6 |
| Stewartstown | 675 | 106 | 569 | 26.0 | 21.9 |
| Stratford | 202 | 47 | 155 | 13.9 | 10.7 |
| Northumberland | 266 | 23 | 243 | 12.4 | 11.3 |
| Lancaster | 839 | 222 | 617 | 30.0 | 22.0 |
| Jefferson | 554 | 132 | 422 | 26.4 | 20.1 |
| Whitefield | 283 | 47 | 236 | 13.8 | 11.5 |
| Milan | 308 | 40 | 268 | 13.4 | 11.7 |
| 11 towns | 5496 | 807 | 4689 | 22.7 | 19.4 |
| Coos County | 6039 | 1032 | 5007 | 7.4 | 6.1 |

* Road mileage based on road classes I, II, IV and V as established by the State Highway Department.

of the relationship of milk cows per mile of road. Comparing the cows per mile of road in the several towns with the County average gives some relative picture of the importance of dairying in these towns. On the basis of all cows in each township, the several towns averaged 22.7 cows per mile of road.

To do a more precise study of the effect of Soil Bank enrollment on density of production and hence marketing costs, the towns of Colebrook and Columbia were selected for further study. These towns have 1,976 acres enrolled in the Program, which is the largest amount for any two towns in the State. On a township basis, they have 19 and 27 percent respectively of their cropland enrolled in the Program. If marketing costs for milk were to change, it would be expected to be evident in these two townships. Minimum mileage milk hauling routes were established for both pre- and post-Soil Bank conditions, assuming no duplication of routes by different dealers. Other restrictions for this model included every- other-day pickup of milk and a bulk tank truck of 1,500-gallon capacity. As would be expected, the analysis of route pickup miles results in a lower ratio of cows per mile than the previous analysis relating miles of town roads to cows. This is the case because of the outgoing and incoming travel associated with pickup routes. There is no difference in the number

of cows per mile of route. For this minimum distance transportation model, density was 13.5 cows per mile for both pre- and post-Soil Bank conditions. It could be concluded that with the anticipated institutional change to bulk milk handling, the Soil Bank Program will not influence milk hauling charges in the two towns with the largest acreages enrolled in the Program.

### Farm Transfer and Expansion

A third way in which the Soil Bank Program affects agriculture in an area is its influence on farm expansion, farm transfers, and beginning farmers. Some farmers reach retirement age each year and the farm ownership must be transferred for operations to continue. Several Soil Bank cooperators were shown to have retired when they placed their farms in the Bank. In the pre-Soil Bank era, some farm transfers were not made immediately and the resources were so downgraded in quality that they will never be used again as an independent unit or at all in agricultural production. In light of this, some cooperators who ceased operations and placed their land holdings in the Soil Bank did not necessarily interfere with the transfer of farms. Interference occurs, however, when an alternative farm is removed from consideration by a prospective farmer seeking a farm to purchase. Also, the price of farms up for sale is bid higher than the price would be in the absence of the Soil Bank Program because there are fewer farms for the same number of prospective farmers to bid for.

Farmers interested in expanding size of operation by adding land are also influenced by the Program and by the above reasons. These operators are bidding for a smaller amount of land. Profit-maximizing land owners would not sell their land now for less than the discounted yield in Soil Bank payments plus the discounted prospective price of the land at the end of the contract period.

The net result then appears to be higher prices for farms and farm land due to the land owner being placed in the better bartering position, causing fewer new farming starts by prospective farmers and fewer expansion possibilities for operating farmers. However available knowledge and data, do not permit appraisal of the quantitative effects of the Program on farm expansion and new farming starts.

## OTHER ECONOMIC EFFECTS OF THE SOIL BANK PROGRAM

The previous discussion dealt with the more obvious economic effects of the Program on the County economy. Other impacts of the Program should be considered. Although they are less tangible, they are important to the long-run welfare of the people of the County.

### Town Tax Problems

The effect of the Program on the individual town tax structure is via the tax base, with the magnitude depending on the method of determining the assessed valuation. Towns differ so greatly in the way values on property are established that it is impossible to appraise quantitatively the impact of the Soil Bank land enrollment on the town tax position. The land and

buildings remain on enrolled units. Only cows have been lost for immediate purposes of taxation.[9] Some land enrolled in the Program might be defined as cropland for the next few years. However, over 54 percent of the total enrollment is scheduled to be planted to trees and must eventually be classed as woodland. When forest land and cropland are valued at different rates, a change in the town tax base is inevitable.

The loss in property valuation will be felt most in the four towns that had more than 15 percent of their total valuation allocated to agricultural properties. Colebrook and Columbia have as much as 18 and 25 percent of their assessed valuations in agriculture when enumerated in 1957 (Appendix Table 11). The fact that these two towns enrolled the highest actual acreages and the highest percentages of their own cropland in the Program, would indicate that they would be most likely to have tax problems associated with the Program.

The majority of the towns in the County should have only minor tax-base problems arising from enrollment of cropland in the Program. This is based on the fact that so many towns have very low proportions of their tax bases in agricultural properties.

## Long-term Land Use

At the time of Program enrollment, the intention of the owners of 54 percent of the cropland was to plant the land to trees (Appendix Table 12). Most of this land would have reverted to brush in the next decade or two and eventually to forest land had there been no Program. If reforestation is allowed to occur by natural processes, foresters estimate that it would take as long as 20 years for the more valuable species to become established even as seedlings. While the actual time for reforestation on a natural seeding basis will vary by size of field and surrounding tree cover, it is obvious that the time period needed for desirable stands is much longer with natural seeding than with planting. Reforestation under the Program was faster and with species of greater potential value. This aspect is a long-run social gain to compensate society in part for its investment in land retirement and tree-planting incentive payments. Essentially, society exchanged from $65 to $155 per acre investment and some production of hay for about 10 to 20 years growth of more desirable forest species.[10] Where milk is a surplus commodity, the hay from these acres could be assigned no monetary value to society.

## Long-run Social Costs

The effect of the Program on long-run social costs can be partly envisioned from a study of Figure 4, which shows the location of agricultural units in the towns of Colebrook and Columbia. Many of the Soil Bank units are located at the ends of roads and on the poorer roads. With the agricultural resources on these units being abandoned, there is a possibility of reducing the cost of maintaining town roads and school bus transportation. It may not involve an actual reduction in mileage but only

---

[9] Farm machinery is not a taxable property in New Hampshire.

[10] Although some stands may be used for Christmas trees, what is cut on this planted acreage is not cut on existing forest land.

a reclassification to seasonal roads thereby eliminating the plowing of snow. The number of families with children living on the rural fringes would be reduced. School bus transportation is a costly public service which could be reduced by participation in the Program.[11]

## CONCLUSIONS

The Conservation Reserve Program in Coos County, New Hampshire was appraised on four bases: (1) Attainment of Program objectives of a reduction in production of crops for which there is a surplus, and increased conservation of natural resources; (2) Impact on the economy; (3) Effect on the efficiency with which resources are utilized; and (4) Future application to New England agriculture.

The conclusions are applicable to the type of agriculture exemplified by Coos County, New Hampshire. They must be thought of in terms of this context and that the Program has been in operation only four years. However, Coos County is typical of many farming communities in New England.

### Attainment of Program Objectives

The study demonstrates that the Conservation Reserve Program did not contribute a great deal toward the objective of reducing agricultural production. About 17 percent of the country's cropland was enrolled in the Program, but milk production was reduced only 3 percent and hay production by a modest amount. The achievement of increased conservation of soil, water, forest and wildlife resources was the most successful aspect of the Program.

The reason production was not greatly affected was apparent and probably was predictable at the time the Program started. Payments were not high enough to attract most operators of organized units, but they were very attractive to owners of unorganized units. In order to attract organized dairy units, incentive payments must be high enough to divert *all* the resources employed in the production process on the farm, the productive values of which in a particular organized unit generally are greater than their sale values as component parts. Besides the basic land components these resources include livestock, buildings, and equipment. In some instances, dairy farmers enrolled in the Program because the discounted expected income from the farm was considerably lower than the discounted expected income from Conservation Reserve payments, plus wages or other income made possible by the shift from farming. These situations were reinforced by a large number of unorganized units with relatively little expected current or future agricultural earnings.

---

[11] Some local governments have placed qualified rural units in the Soil Bank with the intention of reducing total public expenditures. It can be shown that for many rural towns it would be profitable to purchase rural residences, permitting reclassification of roads, reduced school bus transportation, and snow plowing, as well as some maintenance costs. Frequently the public service costs of isolated residences far exceeds tax payments from these units.

## Impact of the Program on the Economy of the Area

The more noticeable changes in the Coos County economy relating to the operation of the Program are:

1. Gross income to the agricultural resources of the county and gross income to all resources of the county do not appear to be appreciably changed by the Program. Based on estimates of possible future income, the Conservation Reserve and practice payments appear to compensate for most of the expected loss of agricultural income from enrolled cropland and complementary resources.

2. The Program induced a change in expenditure patterns influencing different segments of the nonagricultural economy. By shifting resources out of agricultural production, the Program decreased the expenditures for farm operation. However, since total income remained about the same, a shift to the purchase of more consumer goods is anticipated.

3. The costs of nonparticipating farmers were increased through a decrease in the number of rural units available for addition to organized units through renting or purchasing and for producing hay for sale.

## Impact of the Program on Resource Use Efficiency

The more important changes in resource use efficiency attributable to the Program are:

1. Historical trends were hastened. A large number of small or uneconomic holdings and operations were enrolled in the Program, thereby speeding up the trends in land and farm adjustment.

2. A major change in land use was facilitated. Cropland being, or soon to be, abandoned was converted to forest land without the long period of unproductiveness associated with natural forest reproduction.

3. Relocation of rural people and retirement of labor resources from agriculture was accelerated and eased. Low-income and underemployed agricultural landowners were provided a way to obtain an income from their land without tying up their labor and other resources in its operation. These landowners were essentially disinvesting in their rural capital.

4. In attaining these changes in resource use, the Program did much to encourage a more efficient use of farm resources. The goals of the Program were to reduce the production of crops for which there is a surplus and promote conservation of natural resources, so incomplete attainment of the efficiency goal is to be expected. However, in the total appraisal of a program such as the Conservation Reserve, a comparison of results should be made against a theoretical optimum resource use pattern. If the program had operated in such a way that the theoretical optimum resource use pattern was obtained, then no acreage under contract would be of greater pro-

ductivity than that still in production. As it happened, trees were planted on some fields of greater productivity than some land parcels remaining in production. On the other hand, the general conclusion is that the Program did tend to concentrate the remaining agricultural production on the more productive resources and in that way it enhanced efficiency.

## Future Application to New England Agriculture

The Conservation Reserve Program is the only current national program that has contributed materially toward solution of the problems of readjustment of people and land use in New England. Many parts of New England are confronted with large numbers of undersized farm units that have no possibility for expansion and with farms that are low in productivity and poorly located with respect to assembly points, main highways, and major farm communities. Considerable social benefit could be gained in New England by continuance of the Program for a number of years if the emphasis were primarily on the objective of facilitating resource conservation through resource adjustment.

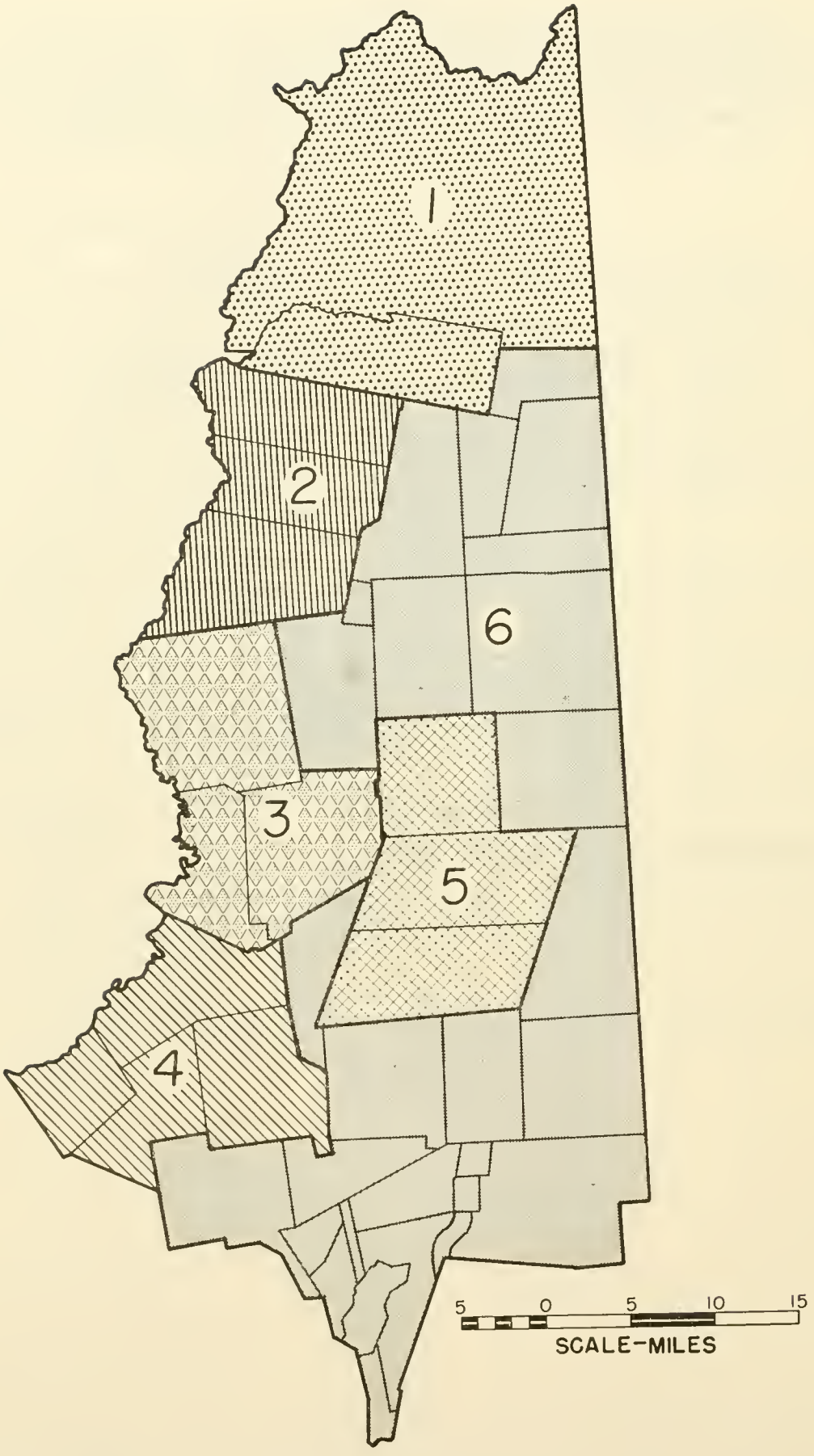
To enable the Program to function more efficiently in the adjustment of resource use, some modifications in the Program might be made with respect to the selection of resources to be withdrawn from agricultural production and to having planted to trees some acreage that is of greater productivity than nearby acreage still in cultivation. To increase the efficiency of the resource reallocation aspects of the Program, the following Program modifications might be made:

1. Permit town governments to buy farms and enroll them in the Program.
2. Empower a local committee to give preference to the applications from farmers whose acreages are low in productivity and poorly located with respect to assembly points, main highways, and major farm communities.
3. Empower a local committee to prevent planting of trees on tracts of land of high productive capacity and of economic size for cropping purposes.

**Appendix Table 1.**
**Area grouping of Townships in Coos County, New Hampshire**

| Area number | Townships included in the area* |
|---|---|
| 1 | Pittsburg<br>Clarksville |
| 2 | Stewartstown<br>Colebrook<br>Columbia |
| 3 | Stratford<br>Northumberland<br>Stark |
| 4 | Lancaster<br>Jefferson<br>Whitefield<br>Dalton |
| 5 | Dummer<br>Milan<br>Berlin |
| 6 | Carroll<br>Errol<br>Gorham<br>Randolph<br>Shelbourne<br>Millsfield |

* Townships not listed do not have cropland.




**Appendix Figure 1. Coos County by areas**

**Appendix Table 2. Distribution of dairy farms and milk cows by herd size, Coos County, 1940 and 1959***

| Herd size | 1940 | | | | 1959 | | | |
|---|---|---|---|---|---|---|---|---|
| | Number of herds | Percentage of total | Number of cows | Percentage of total | Number of herds | Percentage of total | Number of cows | Percentage of total |
| 1-3 | 148 | 19.8 | 340 | 4.2 | 76 | 22.0 | 137 | 2.3 |
| 4-10 | 272 | 36.5 | 1886 | 23.2 | 59 | 17.1 | 416 | 6.9 |
| 11-15 | 160 | 21.4 | 2084 | 25.6 | 36 | 10.4 | 479 | 7.9 |
| 16-20 | 78 | 10.5 | 1371 | 16.9 | 54 | 15.7 | 997 | 16.5 |
| 21-25 | 48 | 6.4 | 1103 | 13.6 | 34 | 9.9 | 800 | 13.2 |
| 26-30 | 18 | 2.4 | 501 | 6.2 | 30 | 8.7 | 844 | 14.0 |
| 31-35 | 10 | 1.3 | 338 | 4.1 | 15 | 4.3 | 509 | 8.4 |
| 36-40 | 8 | 1.1 | 311 | 3.8 | 18 | 5.2 | 698 | 11.6 |
| 41-45 | 2 | .3 | 84 | 1.0 | 4 | 1.2 | 171 | 2.8 |
| 46-50 | 0 | 0 | 0 | 0 | 14 | 4.1 | 682 | 11.3 |
| 51 and over | 2 | .3 | 113 | 1.4 | 5 | 1.4 | 306 | 5.1 |
| Total | 746 | 100.0 | 8131 | 100.0 | 345 | 100.0 | 6039 | 100.0 |
| Average herd size | | 10.9 | | | | 17.5 | | |

* Data for 1940 based on Woodworth, H. C. and Holmes, J. C., unpublished material, Department of Agricultural Economics, University of New Hampshire. Data for 1959 based on a County survey.

**Appendix Table 3. Type of operation of Soil Bank cooperators at time of contract, related to year of enrollment, Coos County**

| Item | Level of cooperation and type of unit at time of contract | | | | |
|---|---|---|---|---|---|
| | Whole units | | | | |
| | Total | With 4 or more cows or equivalent | Less than 4 cows or equivalent | Part units | All units |
| Total units: | | | | | |
| Number | 120 | 26 | 94 | 9 | 129 |
| Percent | 100 | 100 | 100 | 100 | 100 |
| 1957 Contracts: | | | | | |
| Number | 6 | 0 | 6 | 4 | 10 |
| Percent | 5 | 0 | 6 | 45 | 8 |
| 1958 Contracts: | | | | | |
| Number | 19 | 2 | 17 | 3 | 22 |
| Percent | 16 | 8 | 18 | 33 | 17 |
| 1959 Contracts: | | | | | |
| Number | 95 | 24 | 71 | 2 | 97 |
| Percent | 79 | 92 | 76 | 22 | 75 |

**Appendix Table 4. Estimated acreage of cropland and cropland pasture in rural units, and Soil Bank participation by Township and County, 1959***

| Township | Soil Bank cooperators | | | Organized rural units | | | | | | Unorganized rural units | | | Total town acres |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | With less than 4 cows† | | | With 4 or more cows† | | | With less than 4 cows† | | | |
| | Number | Acres | Percentage of total town acres | Number | Acres | Percentage of total town acres | Number | Acres | Percentage of total town acres | Number | Acres | Percentage of total town acres | |
| Berlin | — | — | — | 3 | 35 | 8 | 7 | 310 | 72 | 3 | 85 | 20 | 430 |
| Carroll | 2 | 28 | 12 | 1 | 15 | 6 | 2 | 190 | 82 | — | — | — | 233 |
| Clarksville | 3 | 26 | 2 | 4 | 147 | 11 | 14 | 1054 | 83 | 2 | 48 | 4 | 1275 |
| Colebrook | 18 | 1190 | 19 | 5 | 74 | 1 | 52 | 4747 | 78 | 4 | 110 | 2 | 6121 |
| Columbia | 19 | 786 | 27 | 1 | 12 | § | 22 | 1904 | 65 | 9 | 230 | 8 | 2932 |
| Dalton | 2 | 44 | 4 | 19 | 403 | 42 | 6 | 294 | 31 | 11 | 217 | 23 | 958 |
| Dummer | 3 | 81 | 24 | 4 | 59 | 17 | 4 | 154 | 45 | 2 | 45 | 13 | 339 |
| Errol‡ | 2 | 118 | 34 | 7 | 90 | 26 | 4 | 140 | 40 | — | — | — | 348 |
| Gorham | 1 | 4 | 6 | — | — | — | 2 | 60 | 94 | — | — | — | 64 |
| Jefferson | 8 | 243 | 11 | 3 | 65 | 3 | 34 | 1821 | 80 | 6 | 150 | 6 | 2279 |
| Lancaster | 17 | 613 | 14 | 18 | 443 | 10 | 45 | 3182 | 72 | 12 | 176 | 4 | 4414 |
| Milan | 7 | 285 | 19 | 9 | 185 | 12 | 16 | 887 | 60 | 7 | 130 | 9 | 1487 |
| Northumberland | 10 | 522 | 21 | 2 | 65 | 3 | 14 | 1754 | 70 | 4 | 150 | 6 | 2491 |
| Pittsburg | 4 | 196 | 11 | 9 | 270 | 15 | 10 | 888 | 51 | 9 | 412 | 23 | 1766 |
| Randolph | — | — | — | — | — | — | 2 | 65 | 72 | 1 | 25 | 28 | 90 |
| Shelbourne | 2 | 138 | 41 | 7 | 185 | 56 | 1 | 10 | 3 | — | — | — | 333 |
| Stark | 6 | 148 | 23 | 3 | 96 | 15 | 8 | 377 | 57 | 2 | 35 | 5 | 656 |
| Stewartstown | 10 | 382 | 15 | 7 | 93 | 4 | 37 | 2000 | 77 | 2 | 110 | 4 | 2585 |
| Stratford | 9 | 312 | 21 | 5 | 76 | 5 | 14 | 1030 | 68 | 3 | 90 | 6 | 1508 |
| Whitefield | 6 | 88 | 8 | 5 | 80 | 7 | 15 | 645 | 60 | 13 | 265 | 25 | 1078 |
| Coos County | 129 | 5204 | 16.6 | 112 | 2393 | 7.6 | 309 | 21512 | 68.5 | 90 | 2278 | 7.3 | 31387 |

* Towns not listed do not have cropland.
† Other livestock and crops converted to cow equivalents.
‡ The Town of Millsfield included in Errol.
§ Less than 1 percent.

**Appendix Table 5. Estimated proportion of County cropland acreage in rural units and the Soil Bank by area, 1959**

| Area* | Soil Bank cooperators | | Organized rural units | | | | Unorganized rural units | | Area total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | With less than 4 cows† | | With 4 or more cows | | | | | |
| | Acres | Percentage of county acreage | Acres | Percentage of county acreage | Acres | Percentage of county acreage | Acres | Percentage of county acreage | Acres | Percentage of county acreage |
| 1 ..... | 222 | 4 | 417 | 17 | 1942 | 9 | 460 | 20 | 3041 | 10 |
| 2 ..... | 2358 | 45 | 179 | 7 | 8651 | 40 | 450 | 20 | 11638 | 37 |
| 3 ..... | 982 | 19 | 237 | 10 | 3161 | 15 | 275 | 12 | 4655 | 15 |
| 4 ..... | 988 | 19 | 991 | 42 | 5942 | 28 | 808 | 36 | 8729 | 28 |
| 5 ..... | 366 | 7 | 279 | 12 | 1351 | 6 | 260 | 11 | 2256 | 7 |
| 6 ..... | 288 | 6 | 290 | 12 | 465 | 2 | 25 | 1 | 1068 | 3 |
| County ..... | 5204 | 100 | 2393 | 100 | 21512 | 100 | 2278 | 100 | 31387 | 100 |

* For a description of the Area see Appendix Table 1 and Appendix Figure 1.

† Other livestock and crops converted to cow equivalents.

**Appendix Table 6. Machinery and buildings on whole units enrolled in the Soil Bank by area, 1959**

| Area* | Number of units | | | | | Number whole units |
|---|---|---|---|---|---|---|
| | With machinery | With farm buildings | With dwelling | Without dwelling | No report | |
| 1 | 1 | 2 | 2 | 2 | 1 | 5 |
| 2 | 16 | 24 | 26 | 20 | — | 46 |
| 3 | 11 | 15 | 17 | 5 | 1 | 23 |
| 4 | 5 | 13 | 23 | 6 | 1 | 30 |
| 5 | 2 | 8 | 7 | 3 | — | 10 |
| 6 | 2 | 5 | 5 | 1 | — | 6 |
| County | 37 | 67 | 80 | 37 | 3 | 120 |

* For a description of the Area see Appendix Table 1 and Appendix Figure 1.

**Appendix Table 7. Economic characteristics of the Coos County population by sex, 1950***

| Item | Number of males | Percentage of total | Number of females | Percentage of total | Total | |
|---|---|---|---|---|---|---|
| | | | | | Number | Percent |
| Total population 14 years and over | 13,352 | 50.1 | 13,284 | 49.9 | 26,636 | 100.0 |
| Labor force | 10,308 | 100.0 | 3,241 | 100.0 | 13,549 | 100.0 |
| employed | 9,401 | 91.2 | 3,101 | 95.7 | 12,502 | 92.3 |
| unemployed | 907 | 8.8 | 140 | 4.3 | 1,047 | 7.7 |
| Agriculture | 1,012 | 10.8 | 36 | 1.2 | 1,048 | 8.4 |
| Construction | 587 | 6.2 | 14 | .5 | 601 | 4.8 |
| Forestry† | 42 | .5 | — | — | 42 | .3 |
| Manufacturing | 4,486 | 47.7 | 1,036 | 33.4 | 5,522 | 44.2 |
| Transportation | 416 | 4.4 | 22 | .7 | 438 | 3.5 |
| Wholesale and retail trade | 1,186 | 12.6 | 574 | 18.5 | 1,760 | 14.1 |
| Services, business, lodging, etc. | 729 | 7.8 | 533 | 17.2 | 1,262 | 10.1 |
| Services, professional | 303 | 3.2 | 603 | 19.4 | 906 | 7.2 |
| Other | 640 | 6.8 | 283 | 9.1 | 923 | 7.4 |

* 1950 U. S. Census of Population, Bu. of the Census, U. S. Dept. of Commerce.

† Does not include logging.

**Appendix Table 8. Change in agricultural production in Coos County directly attributable to the Soil Bank Program during 1959**

| Item | Basis* | Unit | Amount |
|---|---|---|---|
| Milk | A net reduction of 195 cows attributable to Program. Average production of milk 6,900 pounds per cow, 1959, increasing at average annual rate over the period of analysis of 110 pounds per year. | Cwt. | 13,460 |
| Cull cows | Average herd life 3.5 years. Herd size 195 cows. | Number of animals | 56 |
| Veal calves | Average 0.9 calves per year per cow for 195 cows. Of the calves born 45 percent sold as calves for slaughter. | Number of animals | 79 |
| Hay | A net enrollment of 4,350 acres in the Program. Yield per acre varied by degree of organization on the various units enrolled. On the acreage having cows associated with the production plans, yield per acre including aftermath averaged 1.7 tons. The level of management on units classed as unorganized was enrolled at an average yield per acre of 1.6 tons. However, it was estimated that only 70 percent of this yield was in the form of harvested hay. The remaining 30 percent of the yield was aftermath and usually was not harvested in any form on these units. The net yield for computation purposes for these particular acres is estimated at 1.2 tons per acre.<br><br>Several steps are involved in the computing of the tonnage of hay available:<br>1. Add replacements to cow numbers to get total herd size. The replacement requirement is 55 per year. Forage consumption per mature replacement from birth to freshening is equal to the annual consumption of forage per mature cow.<br>2. Assume total hay equivalent per cow and per replacement to be 5.5 tons of hay equivalent per year. Multiply total herd size by annual consumption rate to get total hay equivalent consumed by herd.<br>3. Based on 1.7 ton per acre yield of land operated in conjunction with livestock, obtain acres of land which would adequately feed the total herd. Subtract this acreage from the total acres (4350) to get acreage with average yield of 1.2 tons per acre. This represents the tonnage available for sale or use by livestock. | Tons | 4246 |

* Bases obtained from farm survey conducted in Coos County. When data was not available from survey, the source was *Farm Management Reference Manual*, New Hampshire Ext. Cir. 307, 1953.

**Appendix Table 9. Predicted decline in cropland and cows had they not been enrolled in the Soil Bank Program, assuming quality of resources were equal to the average of the County**

| Year | Cow numbers | Cropland acres |
|---|---|---|
| 1959 | 195* | 4350* |
| 1960 | 193† | 4200† |
| 1961 | 191 | 4050 |
| 1962 | 189 | 3910 |
| 1963 | 187 | 3770 |
| 1964 | 185 | 3660 |
| 1965 | 183 | 3500 |
| 1966 | 181 | 3380 |
| 1967 | 179 | 3260 |
| 1968 | 177 | 3130 |
| 1969 | 175 | 3030 |
| 1970 | 173 | 2910 |
| 1971 | 171 | 2810 |
| 1972 | 169 | 2710 |

* Estimated on basis of farm survey and previous analysis.

† All extrapolated data based on trends computed in Figure 1 and 2. One of the important assumptions made is that the resources enrolled in the Soil Bank are as economically productive as operating resources in County agriculture.

**Appendix Table 10. Predicted decline in cropland and cows had they not been enrolled in the Soil Bank Program, assuming quality of resources below average of the County**

| Year | Cow numbers | Cropland acres |
|---|---|---|
| 1959 | 195* | 4350* |
| 1960 | 180† | 4015† |
| 1961 | 165 | 3681 |
| 1962 | 150 | 3346 |
| 1963 | 135 | 3012 |
| 1964 | 120 | 2677 |
| 1965 | 105 | 2342 |
| 1966 | 90 | 2008 |
| 1967 | 75 | 1673 |
| 1968 | 60 | 1338 |
| 1969 | 45 | 1004 |
| 1970 | 30 | 669 |
| 1971 | 15 | 335 |
| 1972 | 0 | 0 |

* Estimated on basis of farm survey and previous analysis.

† All extrapolated data based on the assumption that cow numbers and cropland acres enrolled in the Soil Bank would have completely left production by 1972.

**Appendix Table 11. Estimated population and assessed value of property distributed by class of property, Coos County Townships, New Hampshire, 1957**

| Town | Estimated population* | Assessed value† | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Commercial and part-time agriculture including dwellings | | Recreational | | Manufacturing | | Houses, businesses, electric and misc. | |
| | Number | 1,000 dollars | Percent | 1,000 dollars | Percent | 1,000 dollars | Percent | 1,000 dollars | Percent |
| Berlin | 17,932 | 12 | 0.1 | 71 | 0.2 | 16,752 | 56.0 | 13,079 | 43.7 |
| Carroll | 399 | 2 | .1 | 1,345 | 73.1 | — | — | 492 | 26.8 |
| Clarksville | 166 | 67 | 19.9 | 30 | 8.9 | 8 | 2.4 | 232 | 68.8 |
| Colebrook | 2,051 | 511 | 17.7 | 203 | 7.0 | 63 | 2.2 | 2,114 | 73.1 |
| Columbia | 415 | 126 | 25.2 | 33 | 6.6 | 2 | .4 | 339 | 67.8 |
| Dalton | 581 | 65 | 10.6 | 56 | 9.1 | 15 | 2.4 | 480 | 77.9 |
| Dummer | 198 | 29 | 5.9 | 27 | 5.4 | — | — | 440 | 88.7 |
| Errol | 226 | 18 | 1.9 | 104 | 11.0 | 126 | 13.4 | 694 | 73.7 |
| Gorham | 2,857 | 2 | .1 | 186 | 3.0 | 3,428 | 55.5 | 2,555 | 41.4 |
| Jefferson | 602 | 147 | 11.0 | 361 | 26.9 | — | — | 832 | 62.1 |
| Lancaster | 3,148 | 658 | 9.4 | 565 | 8.1 | 446 | 6.4 | 5,300 | 76.1 |
| Milan | 769 | 149 | 14.3 | 143 | 13.7 | — | — | 753 | 72.0 |
| Northumberland | 2,492 | 107 | 3.0 | 83 | 2.3 | 2,036 | 56.7 | 1,363 | 38.0 |
| Pittsburg | 693 | 82 | 4.7 | 216 | 12.4 | 2 | .1 | 1,449 | 82.8 |
| Randolph | 162 | 5 | .6 | 479 | 52.4 | — | — | 430 | 47.0 |
| Shelburne | 243 | 57 | 6.1 | 78 | 8.3 | 124 | 13.3 | 675 | 72.3 |
| Stark | 308 | 45 | 10.0 | 64 | 14.3 | — | — | 339 | 75.7 |
| Stewartstown | 893 | 200 | 21.1 | 81 | 8.5 | — | — | 667 | 70.4 |
| Stratford | 1,058 | 96 | 6.4 | 33 | 2.2 | 602 | 40.2 | 767 | 51.2 |
| Whitefield | 1,660 | 103 | 2.3 | 1,483 | 33.0 | — | — | 2,912 | 64.7 |
| All others‡ | 107 | 29 | 3.8 | 326 | 42.4 | — | — | 414 | 53.8 |
| Total§ | 36,960 | 2,510 | 3.7 | 5,967 | 8.7 | 23,604 | 34.5 | 36,326 | 53.1 |

* *Local Population Estimates, New Hampshire, 1956*, N. H. State Planning and Development Commission, 1957.
† *Initial Town Property Survey Report, New Hampshire, 1957*, N. H. State Planning and Development Commission, 1959.
‡ Wentworth's Location, Millsfield, and Dixville.
§ Not equalized valuations, so comparisons between towns cannot be made on an absolute basis.

**Appendix Table 12. Cropland use the year preceding enrollment in the Soil Bank and planned cover for acreage enrolled by area, Coos County, New Hampshire, 1957-59**

| Area | Total acreage | Use, year preceding enrollment | | | | | Planned use | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Retain existing cover | | Plant to trees | |
| | | Potatoes | Oats | Hay | Corn | Other | Acreage | Percentage of total acreage | Acreage | Percentage of total acreage |
| | Acres | Acres | Acres | Acres | Acres | Acres | Acres | Percent | Acres | Percent |
| 1 | 221.8 | — | — | 221.8 | — | — | 56.6 | 26 | 165.2 | 74 |
| 2 | 2357.8 | 15.0 | 18.0 | 2324.8 | — | — | 708.7 | 30 | 1649.1 | 70 |
| 3 | 982.8 | 4.0 | 32.0 | 906.4 | — | 40.4 | 710.8 | 72 | 272.0 | 28 |
| 4 | 988.1 | 38.3 | 55.5 | 850.8 | 19.5 | 24.0 | 528.6 | 53 | 459.5 | 47 |
| 5 | 365.7 | — | — | 365.7 | — | — | 217.4 | 59 | 148.3 | 41 |
| 6 | 287.8 | — | — | 287.8 | — | — | 173.5 | 60 | 114.3 | 40 |
| County | 5204.0 | 57.3 | 105.5 | 4957.3 | 19.5 | 64.4 | 2395.6 | 46 | 2808.4 | 54 |

* For a description of the Area, see Appendix Table 1 and Appendix Figure 1.